ENVIRONMENTAL ASSESSMENT

for

Wisconsin Electric Power Company
Rothschild 50 MW Biomass-Fired Cogeneration Facility

Docket 6630-CE-305

Application of Wisconsin Electric Power Company for a Certificate of Authority to Construct and Place in Operation a 50 MW Biomass-Fueled Cogeneration Facility to be Located in the Village of Rothschild in Marathon County, Wisconsin

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Introduction

Wisconsin Electric Power Company (WEPCO), a utility subsidiary of Wisconsin Energy Corporation (WE Energies), applied to the Public Service Commission of Wisconsin (PSC or Commission) for authority to construct, install, and place in operation equipment that will combust biomass to provide electricity and steam in a circulating fluidized bed boiler at the Domtar Corporation (Domtar) paper mill facility in Rothschild, Wisconsin.[1] The project would support about 50 megawatts (MW) of electric generation capacity. All of the steam needed for the Domtar mill processes would be supplied by the new boiler and turbines. If the Commission approves the project, it will issue a Certificate of Authority (CA) to WEPCO.

This is a Type II action under Wis. Admin. Code § PSC 4.10(2). Under Wis. Admin. Code § PSC 4.10(2), Table 2.a, an environmental assessment (EA) is needed for the review of a cogeneration facility at the site of an existing electric generation facility. The Domtar mill currently supports about 4.66 MW of hydro capacity and an on-site steam turbine connected to existing Domtar boilers that generates about 5 MW. This existing generation at the site meets the definition of "electric generation facility" in PSC 4.05(6). The proposed biomass project would be located in an area actively used by the mill for wood storage, wood transport, and trailer parking. Currently, large trucks transport the stored wood from this area to the existing mill boiler located on the northern end of the property. The project would use the mill's water systems and truck entrance and a portion of the existing conveyer system.

> ***Note:*** *The utility has also applied to the Wisconsin Department of Natural Resources (DNR) for air pollution control permits under Wis. Stat. ch. 285. The level of expected pollutant emissions qualifies the DNR permit action as a Type 2 action under Wis. Admin. Code § DNR 150.03(8)(b)1.a. A separate EA is being prepared by DNR for its Rothschild project air pollution control permit review.*[2]

Notification of the Commission's intent to prepare an EA, including a solicitation for comments on the environmental aspects of this project, was mailed to the entire project mailing list, including local residents and municipal officials, and land managers within a 100 mile radius of Rothschild on April 27, 2010.[3] Because of the broad geographical scope of the potential project impacts, the notification was distributed to:

- Legislators representing areas within 100 miles of Rothschild;
- The clerks of each county, city, village, and township that lies at least partly within 100 miles of Rothschild;
- Local news media that serve areas within 100 miles of Rothschild;
- The North Central Wisconsin Regional Planning Commission, Northwest Wisconsin RPC, West Central RPC, Mississippi River RPC, East Central RPC, and Bay Lake RPC;
- County foresters and extension agents serving the counties that lie at least partly within a 100-mile radius from Rothschild;
- Public libraries serving areas within a 100-mile radius of Rothschild;
- The Living Forest Coop, WTFC Tree Farm, and Wisconsin Woodland Owners Associations; and
- Other persons with a demonstrated interest in the project.

[1] PSC REF #128334.
[2] DNR's Rothschild project EA is being coordinated by Tom Lovejoy, Natural Resources Program Manager, Environmental Analysis, West Central Region, Wisconsin Department of Natural Resources, telephone (715) 839-3747, or e-mail tom.lovejoy@wisconsin.gov.
[3] PSC REF #131086.

Responses to the notification included written and telephoned complaints from local Rothschild residents about an error and disagreements with the "Project Description" section. A letter was sent to the same mailing lists on May 4, 2010,[4] to acknowledge the error and clarify that the descriptive statements were based on assertions in the project application.

A third letter was sent to the list to set a deadline for comments at June 15, 2010.[5]

The Gas and Energy Division of the Commission prepared this EA in cooperation with the DNR Office of Energy to determine if an environmental impact statement (EIS) is necessary under Wis. Stat. § 1.11. A preliminary determination was made on August 26, 2010, concluding that preparation of an EIS was not warranted.[6] This preliminary determination was followed by a comment period that extended to September 16, 2010. Several parties to the case and a number of citizens disagreed with the preliminary determination. Their comments are summarized in a table in Appendix B at the end of this document. Sections 5.0 and 6.0 of this document address how the Commission has complied with Wis. Admin. Code § PSC 4 and Wis. Stat. §1.11 by preparing this EA.

A hearing on the project, as requested by the Commission, will be held in November-December, 2010.

1. Project Description

1.1 Facility Background

In November 2008, the Wisconsin Paper Council (WPC) responded to a request by WEPCO and issued a solicitation to its members for potential steam partners to facilitate construction of a biomass power plant. Domtar responded to the solicitation, and it represented the only paper mill facility that met WEPCO's criteria for a cogeneration and wood procurement partner, as described below in Section 1.4.

The mill is located between the Wisconsin River on the west and Business U.S. Highway (USH) 51 to the east, just south of the Business USH 51 and State Trunk Highway (STH) 29 interchange. Interstate Highway 39 (I-39) is located a short distance to the west across the river and intersects with STH 29 northwest of the mill. The map in Attachment 1[7] shows the location of the mill in the community.

Domtar's Rothschild mill has an ongoing pulping operation and pulpwood storage. The papermaking machinery is enclosed in a large, low building in the center of the property, with pulpwood storage largely to the north and water treatment facilities along the Wisconsin River to the south. A large warehouse with active truck traffic is also located in the southern portion of the property. The company has four operating mill boilers to produce steam for the papermaking operation. Those boilers would be retired if the proposed project were built. The company can produce about 4.66 MW of electricity in a hydroelectric generator facility at a dam it operates along the Wisconsin River and about 5 MW of electricity from a steam turbine connected to mill boilers. All of the electricity currently produced is used by Domtar. Space on the southern end of the Domtar property currently is used for trucks and some wood storage. The location for the

[4] PSC REF #131087.
[5] PSC REF #131868.
[6] PSC REF #137467.
[7] CA Application, Appendix J, "Exhibit 1A: Plant Location Map," PSC REF #128341.

biomass-fired cogeneration plant would be in this area, sandwiched around the mill facilities at the south end of the property and closer to the river.

1.2 Project Purpose and Need

The proposed project is not needed to meet WEPCO's near-term energy or capacity needs. With the recent completion of the new Elm Road coal-fired facilities, WEPCO's capacity will be adequate until the early 2020s, depending on load growth. PSC engineering staff is evaluating how the project fits into WEPCO's generation portfolio and how it compares to other alternatives. It is also completing a cost/benefit analysis. The results will be discussed at the project hearing.

A project like this, however, is required as part of an agreement with Clean Wisconsin and Sierra Club regarding their challenge to the Elm Road Project water discharge permit. As part of the agreement, WEPCO was required to "submit to the PSCW an application, which it believes in good faith to be complete, to obtain approval of, and rate recovery for, construction of a total of 50 MWs of non-food crop biomass generation in Wisconsin, and shall also timely submit all applications for any other required approvals." The site could be selected by the company and could be at the site of existing electric generating facilities. WEPCO may decline to build the power plant if it does not get rate recovery approval from the Commission. The plant must be 100 percent biomass-fired, not co-fired, and must be designed to operate at a high capacity factor. One purpose of the proposed cogeneration plant for this docket would be to meet the requirements of that agreement. Both Clean Wisconsin and Sierra Club agreed to support WEPCO's applications by filing written comments with appropriate regulatory agencies. These comments have not been filed at the time of this EA preparation.

Another purpose of the project would be to help WEPCO meet the Wisconsin Renewable Portfolio Standard (RPS) in Wis. Stat. § 196.378. The biomass fuel would qualify as a renewable resource under Wis. Stat. § 196.378(1)(h)1.g, and the woody material planned for use as fuel, including mill waste, would qualify as biomass under Wis. Stat. § 196.378(1)(ar).

The RPS requires each electric provider in the state to meet increasing percentages of its retail energy sales with renewable energy. The increasing percentages are to be added to each provider's historical baseline renewable percentage. The RPS defines the baseline renewable percentage as the average of the energy provider's renewable energy percentage for 2001, 2002, and 2003. WEPCO's baseline renewable percentage is 2.27 percent. By 2010, the renewable energy percentage must be at least two percentage points above the baseline. So, based on its most recent load forecast, WEPCO's percentage for 2010 must rise to 4.27 percent (about 1.1 million megawatt hours (MWh)). By 2015, the percentage must increase to at least six percentage points above the baseline, putting WEPCO's 2015 percentage at 8.27 percent or about 2.2 million MWh. WEPCO computes a shortfall in renewable energy needed to meet its RPS requirement by 2015.[8]

The proposed project would produce about 310,000 MWh per year of energy from biomass to help meet those requirements.

1.3 Project Location

The project would be located on the south side of the Domtar property. The new facility would be built on that existing industrial site and share infrastructure and resources with it.

[8] Project CA application, Technical Support Document, pp. 4-5.

Domtar's property's location is shown in Attachment 1, which is an aerial overview of the Rothschild area along the Wisconsin River. The proposed cogeneration facilities are shown on the south end of the Domtar property in the drawing in Attachment 2.[9]

The property has been home to an active pulp and paper mill since 1910; the part of the property that would support the project has been mainly unpaved and used for wood storage or semi trailer storage that is part of the mill's warehouse and shipping operation. Recent soil borings have not revealed any contamination, although some pockets of soil with oil products may be present either on the surface or just below the ground as a result of grading for truck traffic.

1.4 Siting Process

The site selection process that WEPCO pursued for this project was based mostly on the company's desire to integrate its required biomass-powered operation with a partner operation that had wood procurement experience. WEPCO states that the availability of an acceptable fuel supply was its primary consideration for siting a biomass power plant and that a brownfield or existing industrial site was its secondary consideration. It sought a paper mill with an existing pulping operation so that it could have a partner that already buys pulpwood. The partner would be one that has "a long history of procuring forest products in a responsible and sustainable manner and who understands and respects the implications of procuring biomass on the current forest products industry."[10] Sharing space at an operating paper mill with an active pulping operation would fit the company's considerations and also possibly provide a customer for process steam to allow a more efficient, cogeneration-type project to be operable.

According to the company, it was contacted by independent power producers (IPP) that were developing biomass projects in the region and looking for an equity partner. WEPCO says it responded to these contacts by indicating that it was not looking to contribute equity to a new project but could be interested in acquiring an already developed site or receiving a proposal for a power purchase agreement. Neither of these developments appears to have occurred.

WEPCO worked with the Wisconsin Paper Council (WPC) in November 2008 to solicit its members for potential partners in the project. Three paper mills responded, but only Domtar fit WEPCO's selection criteria:

- Located in Wisconsin
- Operating pulp mill
- Viable and sustainable fuel source
- Ability to survive a change in mill ownership or closure and abandonment

The two other responding mills did not have pulping operations and were not pursued by the utility. In May 2009, the utility and mill agreed to develop the power plant in Rothschild.

On the mill site itself, WEPCO states that it initially considered locating its plant on the north end of the Domtar property. However, the area available there was too small and also could negatively affect mill operations. So, the southern end of the property was selected for the proposed project.

[9] CA Application, Supplement to TSD Appendix H Local Permits, Notices and Approvals Part One, "Partial Site Plan General Arrangement," PSC REF #135784.
[10] WEPCO response to staff data request 01.33, PSC REF #132214.

1.5 Project Design

The proposed facility is designed to produce process steam for the paper mill and electricity for the transmission grid. It would provide all of the mill's process steam requirements. Steam would be produced by heating filtered water from the Wisconsin River. The steam would drive the 50 MW electric turbine and generator and then be sent to the mill.

1.5.1 WEPCO-Domtar relationship

The proposed relationship between the electric company and the paper mill is that WEPCO would rent land on which a biomass cogeneration plant would be built and operated, supplying WEPCO customers with electricity and the Domtar paper mill with process steam. The relationship would include the following:

- The utility would rent land on the Domtar property for the biomass facilities.
- The utility would own the power plant facility.
- Either WEPCO or Domtar under contract to WEPCO would operate the new plant.
- The utility would provide Domtar with its entire process steam requirement according to the same cost allocation method that WEPCO uses in Milwaukee for its Valley Power Plant.
- Domtar would act as WEPCO's agent to procure the woody biomass that would fuel the new plant.

There are a series of agreements between We Energies and Domtar that would cover these relationships. The agreements are confidential documents.

1.5.2 Modifications to the existing Domtar site

Modifications to the existing Domtar plant would include installation of the new biomass plant and biomass fuel handling systems, rearrangement of the plant gate and roadways to accommodate the new biomass energy facility, and connections from the existing water intake and wastewater treatment facilities to accommodate the needs of the new biomass energy facility. The existing Domtar water intake and wastewater facilities on the Wisconsin River would be adequate to handle the needs of the new cogeneration plant and would not require modification.

The new facilities, to be located south of the main paper mill buildings, would include (see WEPCO's proposed project site plan in Attachment 2):

- Biomass weigh scales and truck dumper
- Biomass screening and grinding building
- Belt conveyors and a biomass storage building, about 340 feet long by 190 feet wide
- Biomass-fired, circulating fluidized bed (CFB) boiler in a boiler building about 200 feet tall, plus a 265 foot exhaust stack and feed silos and flue gas treatment facilities
- Steam turbine and generator
- Control and electrical facilities
- Cooling towers, probably six towers in a set
- Possible American Transmission Company LLC (ATC) transmission substation, inside a 200-foot by 200-foot fence
- Pipe bridge for pipes to carry raw water to the power plant from the existing Domtar water intake, return condensate from the mill to the power plant, and carry process steam from

the power plant to the mill—would also support the conveyor transporting mill wood room waste to the power plant's biomass storage facility
- Storm water detention pond, with a main pool area of about 60 feet by 180 feet
- A natural gas–fired auxiliary boiler, with a 220-foot tall stack, to back up the CFB boiler
- New natural gas metering facility to connect Wisconsin Public Service's natural gas supply service to the power plant as well as the mill
- Associated paved access roads, drives, and truck parking areas

At this time, Domtar burns about 130,000 tons of woody biomass each year to generate steam for its paper-making process. About 50,000 tons of it comes from the mill out of its paper-making process, and about 80,000 tons of it is purchased from the outside. The proposed cogeneration project would use an additional 370,000 tons per year.

1.5.3 Boilers

The biomass would be burned in a new CFB boiler, to be owned by WEPCO. The boiler would be able to run on 100 percent biomass fuel, and also natural gas for start up and flame stabilization purposes. The CFB would provide flexibility to help the company work with the potential variety of fuels that might be burned as the relatively new biomass supply industry continues to develop.

There would also be a natural gas-fired auxiliary boiler, to be owned by WEPCO, that would back up the proposed CFB boiler and feed the process steam header to the mill directly when the mill requires process steam and the CFB boiler is unavailable, or when "maximum electric generation is required."[11] It would be capable of providing about 250,000 pounds of steam per hour. The auxiliary boiler is expected to run between 500 and 1,000 hours per year.

1.5.4 Generation and transmission of electricity

According to the project application, the plant would be designed to provide about 50 MW of generation capacity, with about 44 MW of operating capacity, and about 310,000 MWh per year of energy. Steam from the CFB boiler would be sent to an automatic extraction turbine-generator. Steam taken from the turbine generator for mill processes would slightly reduce net electric generation capability.

WEPCO states that the plant would run at least at 15 MW of electric capacity and about 60 percent of the boiler's capacity to ensure that Domtar always has the steam it needs for the paper mill. The rest of the electric capacity would be dispatched when it was the most economical generation available to meet load.

WEPCO is currently evaluating two electric transmission interconnection options. They are:

- A new ATC 115 kilovolt (kV) switchyard located on the project site on Domtar land that would connect via a double-circuit loop 115 kV electric transmission line to existing ATC line Z52, about one-half mile west of the mill, just west of I-39. The Midwest Independent Transmission System Operator, Inc. (MISO) and ATC issued a draft study on July 23, 2010, that confirms the route and an estimated cost of approximately $6.5 million. At the time of this EA, ATC is contracting to examine the site and potential crossings of the Wisconsin River and I-39 in preparation for design of the new double-circuit 115 kV line.

[11] WEPCO response to staff data request 01.45, PSC REF #132284.

- A new Wisconsin Public Service Corporation (WPSC) 46 kV substation located on the project site on Domtar land that connects to the existing 46 kV distribution line that supplies the Domtar mill substation. On August 10, 2010, WPSC issued studies on an interconnection with the 46 kV system that confirm the technical feasibility of the interconnection utilizing existing right-of-way (ROW) and connecting to a new substation on the mill property. Estimated cost of this route is $1.5 million.

WEPCO says it would sell all of the plant's electric generation to MISO and receive all of the revenue from the energy sales to MISO. WEPCO also buys all of the energy needed to serve its demand from MISO, so it would effectively be using all of the plant's output to serve its customers. Slightly over 90 percent of WEPCO's electric demand is in Wisconsin, with slightly less than 10 percent outside of Wisconsin. WPSC does not intend to buy the electricity for its customers.

The WPSC interconnection option is the utility's favored option because of its lower cost and fewer environmental and social impacts. WEPCO has indicated that it is proceeding with negotiations for an Interconnection Agreement with WPSC.

1.5.5 Generation and distribution of steam

Raw water would be provided from the existing Wisconsin River water intake system after filtering and demineralizing. Steam would be produced by the CFB boiler at about 1,550 pounds per square inch (psig) and 950°F, and sent to the extraction turbine-generator.

WEPCO indicates that normally, steam for the mill would be taken from the extraction turbine generator. It would be extracted from the turbine at 200 psig and sent to the mill *via* a new steam line along a new pipe bridge connecting the two facilities. Domtar's average process steam requirement is about 200,000 pounds per hour at 180 psig and 450°F. Condensate from the mill would be returned to the biomass plant for reuse. There would also be cooling towers to aid in condensing the remainder of the turbine steam.

A turbine bypass would also be installed to maintain a reliable steam supply to the mill if the turbine trips. In case the boiler has to go out of service, for maintenance or repairs, WEPCO proposes to have two natural gas-fired auxiliary boilers available to produce the mill's full steam need.

1.5.6 Natural gas supply

Natural gas for the CFB boiler and auxiliary boilers would be supplied by an existing WPSC natural gas lateral pipeline that already supplies the paper mill. Other than a new metering facility to connect the service for WEPCO, there would be no other modifications needed to the WPSC natural gas distribution system except the piping to bring the natural gas to the new auxiliary boiler on the project site. WEPCO estimates the boiler need at about 5,600 standard cubic feet per minute at about 60 to 80 psig at full load.

1.5.7 Biomass supply

WEPCO states in its application that the optimal fuel for this project would be woody biomass. About 500,000 green tons of biomass would be needed annually to fuel the plant. This yearly amount translates into about 1,370 tons per day or about 57 tons per hour. The biomass would likely come from one of the following sources:

- Logging operations where trees are harvested for timber and the tops and branches are available for harvest as biomass. The utility expects this biomass to be the primary source and anchor fuel;
- Discarded woody material from primary manufacturing facilities like paper mills, sawmills, or chip mills;
- Leftover woody material from secondary manufacturers such as door, window, or cabinet manufacturers;
- Wood waste from municipalities, tree service companies, or construction companies;
- Whole trees cut as part of operations with objectives other than timber or pulpwood harvest, such as pest control (*e.g.* emerald ash borer), power line ROW clearing, forest regeneration work, timber stand improvement, salvage after fires or tornados, fire lane creation, or reclaiming of land meant for other purposes.

Domtar would be WEPCO's procurement agent for the biomass fuel and would negotiate and enforce all supplier requirements. However, the contractual relationship for the supply of woody biomass would be between the suppliers, or biomass harvesters, and WEPCO. There is a Fuel Supply Agreement between WEPCO and Domtar that defines how Domtar would work with suppliers and with WEPCO to ensure a steady supply of biomass that conforms to existing guidelines and laws, including specifics about the terms of all supplier contacts and remedies for suppliers' noncompliance with biomass harvesting guidelines and Best Management Practices.[12]

At this time, Domtar says that it supplies the Rothschild mill through about 100 pulpwood suppliers. Twelve of the suppliers contribute about 65 percent of the wood and, according to Domtar, have established themselves as consistently able to fulfill their contracts. WEPCO's application states that Domtar buys its wood on the open market instead of purchasing standing timber or land to harvest.

About 50,000 green tons of fuel per year, or about one tenth of the fuel needed, would come from the Domtar mill on site. This fuel would include wood waste generated during log debarking and chipping at the mill, wood knots and other "uncooked" pieces of wood that are screened out of the pulping process, and residue from the mill's waste water treatment facility.

WEPCO acknowledges that other biomass fuels may develop over time, and that the CFB boiler technology and the handling facilities would be designed to address a wide variety of potential fuels. Use of dedicated woody biomass plantations, non-woody energy crops, and agricultural residues are not anticipated by the company at this time.

1.5.8 Biomass delivery and handling on site at Domtar plant

Domtar and WEPCO indicate that the biomass from harvest sites would be delivered to the Rothschild plant by truck. The utility states that the trucks would enter Rothschild from sources within a radius of about 100 miles. Domtar states that its expected biomass procurement radius is 75 miles, although wood is currently received by the mill from as far away as 120 miles. The likely access route to the plant would be from the STH 29 off ramp to Business USH 51. The plant lies about a half mile south of STH 29 along Business USH 51. The planned entrance to the plant for the biomass trucks would be in the area of the existing south entrance to the property. (See Attachment 2.)

[12] PSC REF #133865 which, as a business contract, is confidential.

The biomass from outside the mill would arrive in chipped form by covered trailer trucks, and the proposed plant's biomass receiving facility[13] would include weigh scales, two hydraulic extended-arm truck dumpers, and a reclaim hopper for self-unloading trucks.

Some of the biomass would be arriving at the plant from inside the Domtar mill property. Mill wood processing and pulping wood waste would be transported by conveyor to the biomass plant from the nearby mill facility. A new conveying system and cyclone separator for the mill's pulp screen rejects would move the pulp screen rejects to the mill's "woodroom," where they would be mixed with woodroom bark. From the woodroom, a new biomass fuel conveyor system would move the combined mill wastes to the biomass handling area for WEPCO's CFB boiler.

The mix of biomass fuel at the plant would be handled by a system of enclosed conveyors and processing facilities. A hogging/screening building would be installed at the plant to chop and size the biomass material so the boiler can use it efficiently. [14] The waste materials from the mill and biomass from incoming trucks would each be conveyed to this building. Here, the materials would be blended together and transported by conveyor to an enclosed biomass storage facility.[15] The storage facility would be roughly 65 feet high, 340 feet long and 190 feet wide. It would hold about eight or nine days' worth of fuel, or up to 20,000 tons of biomass. The stored fuel would eventually be moved out of the storage building onto a conveyor that would move it to the boiler fuel silos, located about 130 feet above the ground next to the boiler building. There would also be a bypass chute on the conveyor to the storage building to allow fuel to bypass the storage building and be deposited directly into the boiler silos if needed.

Dust collection systems would be installed at transfer points to manage fugitive dust.

1.5.9 Ash from combustion

The combustion of biomass would result in the production of about 20,000 tons per year of bottom ash and fly ash, and new ash handling systems would be constructed. Bottom ash would be removed by a mechanical conveyor. Fly ash would be collected in a new fabric filter bag house and conveyed to a new storage silo and unloader. Ash would be removed from the property by truck.

1.5.10 Project cost

The proposed project would be a new biomass-fired facility and supporting facilities, and the capital cost for the project totals about $ 290.1 million.[16]

There would be an additional cost for connection to the electric grid, and this cost depends on how the connection is made. A connection to the existing WPSC 46 kV line now serving Domtar would cost $ 1.5 million. A connection to the ATC system by building a new line to an existing 115 kV line about a half mile west of the mill would cost $6.5 million. WEPCO states in its application that it is presently negotiating with WPSC to secure that option if possible.

[13] The biomass receiving facility would be next to the existing wastewater treatment plant between the biomass storage facility and the boiler building, behind the existing Domtar warehouse.
[14] The hogging/screening facility building would be located between the biomass receiving area and the boiler building.
[15] The storage facility would be located at the southern end of the project, near South Line Road.
[16] Project application, Technical Support Document, p. 23.

The expected cost of the woody biomass fuel is proprietary information but, generally, the cost per green ton in the upper Great Lakes region appears to be about $20 to $27.[17]

Project cost is expected to be an important issue in the Commission proceeding for the case.

1.5.11 WEPCO's projected project schedule

WEPCO has a stated goal of placing the project on line and in service in late 2013 so that it can take advantage of the federal production tax credit for renewable energy resources that is scheduled to expire at the end of that year. The company would like to begin construction in the spring of 2011 in order to meet that goal. To fit into that construction schedule, WEPCO hopes that the procurement and fabrication of the boiler can be contracted by February 2011. Such contracts cannot be signed unless the project is certified for construction by the Commission, so WEPCO has requested that the Commission approve the project before the end of 2010.

1.6 Permits and Approvals

Before construction on the proposed project is allowed to proceed, a CA is needed from the PSC.

Numerous DNR air and water permits or approvals are also needed. The water permit applications were submitted to DNR on March 15, 2010. The air pollution permitting applications were submitted to DNR on March 24, 2010. They are itemized in Table 1.

Table 1 Expected DNR permits needed for Rothschild Biomass Plant

DNR Air-related Approvals or Permits	DNR Water-related Approvals or Permits
Air Pollution Control Construction Permit	WPDES NR 216 permit for storm water discharges from construction site greater than 1 acre
Air Pollution Control Operation Permit	Endangered Species Review and permitting as needed
Acid Rain Air Permit	Chapter 30 permit for storm water pond, which is an unconnected enlargement within 500 feet of a navigable stream (Wisconsin River)
Clean Air Interstate Rule (CAIR)	

The company also applied to the Wisconsin Department of Transportation (DOT), on March 15, 2010, for permission to alter existing driveway connections from the Domtar property onto Business USH 51. The purpose is to redesign a driveway near the south end of the property to accommodate trucks serving the proposed biomass plant.[18]

At the federal level, notices may need to be issued to the Federal Aviation Administration (FAA) and the U.S. Army Corps of Engineers (USACE). FAA would need to be aware of the taller structures for the proposed plant in order to ensure compliance with air safety laws. This may entail simply entering the structures on maps so that pilots are aware. USACE would have to be consulted for a permit if the company conducts any construction activities in navigable waterways or wetlands.

[17] Project application; Appendix C notes that several estimates have been obtained from several source reports.
[18] WEPCO's application for connection to an existing state trunk highway can be found in Appendix G of the project application.

Certain approvals might be sought by the company from the village of Rothschild as well. These include zoning code variances, flood plain construction approval, and site plan approval. The existing dike or levee currently on the property is not certified as a levee by the Federal Emergency Management Administration (FEMA) and may not provide the protection from flooding that it had in the past. The Domtar property must now be considered to be lying within the Wisconsin River floodplain.

2. Environmental Analysis

There would be potential impacts from constructing and operating the new facilities and from acquiring the biomass fuel. These are discussed below.

2.1 Potential Construction Impacts

Overview

Except for the potential construction of a 115 kV transmission line if the ATC option is selected, potential environmental impacts at the power plant site during construction would largely occur on Domtar's property. The proposed project area is on the Domtar paper mill property between the Wisconsin River and Business USH 51 and, except for delivery routes of materials and equipment, construction work would be confined to the Domtar property. WEPCO states in its CA application that the existing boundary fencing and trees would be maintained through the cogeneration plant construction process. Construction activities would continue through 2011, 2012, and a portion of 2013.

The footprint of the new power plant would be the area between the Domtar warehouse and finishing facilities roughly to the north, the Domtar water treatment clarifier facilities and Wisconsin River to the west, the larger mill warehouse and the South Line Road property boundary to the east, and the River Street, South Line Road, and Rothschild Avenue property boundary to the south. See Attachment 3.[19]

Expected outdoor construction activities include: improvements to the south entrance of the mill property, grading and excavation for the facilities' foundations, pouring of foundations, erection of structural steel skeletons, erection of the CFB boiler, construction of the cooling towers, and enclosure of the buildings. After enclosures are completed, installation of piping, electrical, and mechanical equipment would occur. Laydown for the construction of the main boiler building and other facilities would be on the Domtar property. Once the need for laydown space is alleviated, the material handling systems would be built. The high-voltage electrical facilities would be set up on a schedule to attempt to reduce interferences with the other construction activities. At the end, there would be testing of the plant facilities and final grading and landscaping of the project site.

If the ATC interconnection option is selected by WEPCO for transmission of the electricity produced, a new transmission line ROW would be cleared and a new 115 kV electric transmission line constructed beyond the boundaries of the Domtar property. Potential impacts of construction of this line are discussed below in Section 2.1.4 "Protected resources" because they could include the loss of some wooded wetlands.

The existing Domtar boilers could be removed after the new plant was in operation. There would likely be some dust, noise, and waste generated during the removal, and there could be a potential

[19] CA application, Supplement to TSD Appendix H Local Permits, Notices and Approvals Part One, "Site Plan General Arrangement," PSC REF #135784.

for hazardous wastes such as lead products or asbestos that would require proper disposal. Demolition of the boilers could open up some visual site lines at the north end of the mill and the boilers' air pollutant emissions would no longer occur.

2.1.1 Air pollution emissions, including dust

Potential temporary air pollution emissions resulting from construction work on the site would include diesel emissions from trucks and construction equipment and fugitive dust, where not well controlled. Diesel engines must be kept in good maintenance to avoid excess emissions. Fugitive dust must be controlled by either paving often-used equipment traffic surfaces or wetting the surfaces periodically to bind dust to the ground and keep it out of the air. WEPCO has stated its intention to have haul roads on the site paved, but this might not occur until after construction is underway.

Most earth-moving activity would be excavation because the project site is relatively flat and would not need much leveling. There would be some grading necessary. WEPCO indicates that this would not be extensive. Earth moving would occur mainly in spring of 2011.

"Pockets of oil contaminated soil" could be found during excavation because many trucks have used the area over the years. Under Wis. Stat. ch. 292, and Wis. Admin. Code ch. NR 706 or other rules, WEPCO or Domtar would be required to report, investigate, and clean up the contamination and notify DNR, which oversees such cleanups.

WEPCO's CA application states that fugitive dust during construction would be minimized mainly by "minimizing the extent of disturbed areas where removal of vegetation and topsoil is required, and by placing gravel on access roads and material laydown areas."[20] It also indicates that water tank trucks would wet roads and work areas. Much of the project area on the mill property already has paved access, and that would help control dust during construction.

2.1.2 Traffic

Construction traffic would enter the site through the newly altered south mill entrance on Business USH 51, as permitted by DOT. A quantity of triaxle dump trucks would be expected during foundation excavation and other earth-moving activities in the spring of 2011. Periodic high volumes of concrete trucks would be expected during foundation installations from spring through summer of 2011.

Most construction deliveries are expected to arrive from the STH 29 interchange and would be limited to Monday through Friday during day-shift hours. Typically, there would be five to ten trucks moving through the entrance each day, mostly semi-trailer trucks. Business USH 51 pavement improvements are not expected to be needed. All traffic inside the Domtar fence would need to move around the existing warehouse located by the south entrance to the mill. Existing site roadways are expected to be adequate to handle the heaviest loads. Some loads might arrive *via* rail and off-loaded at the site using the existing mill rail siding. Erection of structures, the CFB boiler, and the turbine/generator would occur between the autumn of 2011 and winter of 2012, and equipment deliveries, including heavy loads, would be expected during that time.

The construction workforce would park on the Domtar property. Between 100 and 300 cars are expected, mainly in the day-shift hours between 6 a.m. and 7 p.m. Some limited night shift or weekend work might occur. Workers are expected to use the south entrance to the property.

[20] Technical Support Document, Section 2.18.5 Dust Control, p. 66.

Neighborhood residents to the south of the plant could experience some increased noise from property entries and construction equipment operation, depending on their locations.

2.1.3 Noise and visual impact

2.1.3.1 Sound levels

The village of Rothschild zoning ordinances set limits for noise. Section 304 under "Environmental Performance" states that: (1) no activity shall produce a sound level at the property boundary that exceeds 85 decibels; and (2) all noise shall be muffled or otherwise controlled so it does not become objectionable because of intermittence, duration, beat frequency, impulse character, or shrillness. Although an exception is made for I-2 Heavy Industrial zones, which includes the paper mill site, WEPCO has stated that it would meet these limits.[21]

During construction of the plant, the deliveries of equipment and operation of construction machinery would generate noise, mostly from diesel engine-driven systems that power most construction equipment such as bulldozers, excavators, dump trucks, cement trucks, and cranes. There would also be the addition of worker traffic through the south entrance of the property. Worker and delivery traffic along Business USH 51 is not expected to result in a large increase in noise. On the other hand, noise from construction equipment is typically high intensity, intermittent, and in short bursts. Such bursts would be notable if they reached the residential neighborhood to the south and were louder than ambient traffic noise on Business USH 51. Examples of construction noise are listed in Table 2.

There are several residences neighboring the property that are nearly 50 feet from some of the proposed construction activity sites and the occupants of these homes may experience noise levels such as those listed in the table or slightly lower levels at slightly greater distances.

Noise impacts on the nearby neighborhood might be reduced by keeping the diesel engine mufflers in good working order. WEPCO states also that most construction would occur during day-shift working hours.

Table 2 Estimated maximum noise levels in A-weighted decibels (dBA)[22] for typical construction equipment[23]

Construction Equipment	Maximum Noise Level (dBA) Typical Range = 50 feet
Bulldozer	85-90
Front end loader	86-90
Truck	84-87
Grader	83-86
Shovel	82-86
Portable generator	81-87
Crane	82-83
Concrete pump	78-84
Tractor	77-82

[21] The village has recently issued a new noise ordinance, and the impact limits are the same as described here.
[22] A-weighting is a filter applied to measured or modeled decibels that reshapes the actual frequency spectrum to one that simulates human hearing response to different frequencies. It emphasizes higher frequencies because humans perceive higher frequencies more than lower ones. To estimate low frequency sound and vibration, a C-weighted filter is used, which communicates lower frequencies more realistically.
[23] Extracted from WPSC Weston Unit 4 Power Plant – Volume 1, Final Environmental Impact Statement, Table 10-9, p. 250.

Before the constructed cogeneration plant would go into operation, steam blows would have to be performed to clean out the boiler and steam path piping before it was connected to the turbine. Although steam blows can be very loud, WEPCO states that silencers would be used to keep the noise level below 85 dBA at the site boundary. The steam blows would be done only during daylight hours. In addition, notifications would be made to the village authorities before any steam blow was to occur in case precautions needed to be taken for vulnerable groups or individuals.

2.1.3.2 Visual impacts

The existing visual landscape of the project site is, of course, the existing industrial mill facilities. During construction, activities on the site might hardly be noticed by some people but appear chaotic to others. Cranes and the tall boiler building and other structures would be new visible features in views of the mill.

There may be some additional construction site or laydown area lighting, but it may not be noticed in contrast to the existing mill property lighting. External lighting should not be needed often because construction would occur during daylight hours. Otherwise, lighting would be specific to the job need to ensure personal safety and would be directional and arranged to reduce glare.

2.1.4 Protected natural land or water resources

There are no protected species or natural communities or landscapes of concern known to exist on the cogeneration plant construction site property. WEPCO states that, based on its reviews of Natural Heritage Inventory database, no construction impacts are expected to threatened, endangered, or special concern species.[24]

No adverse impacts due to construction are expected in the Wisconsin River. No power plant construction activities are required in the river or on its banks. There is a levee about 3,000 feet long along the southern portion of the Domtar property to prevent flooding on the property when the Wisconsin River levels increase. However, the levee is not certified as protection, so much of the proposed project area lies within what is considered the 100-year floodplain of the river. Therefore, the project has to meet village requirements for construction within a 100-year floodplain. New buildings must have first floor levels set at least two feet above the 100-year floodplain elevations. WEPCO has supplied a hydraulic analysis in its CA application, and this analysis appears to verify that construction of the cogeneration plant buildings would not cause a regional Wisconsin River floodwater elevation increase of more than 0.01 feet. [25]

Construction is not expected to alter local geology, but about 50,000 cubic yards of local soils would need to be replaced. Blasting would not be needed. Soil borings taken in the proposed project site indicate that the soils on the site are not suitable to support the foundations that the plant would need. They would have to be removed and replaced with engineered fill. Removed soils would be used elsewhere on the site for non-structural grading, or they would be trucked away from the site. Soils exposed during construction could be eroded, perhaps into the existing surface storm water drainage system, but the applicant states that Best Management Practices for erosion control would be used and that a detailed construction site and sediment control plan would be developed that would incorporate appropriate DNR technical standards. Erosion and sedimentation control would be managed with silt fencing, inlet protection at catch basins, ditch checks, sediment traps, and a wet storm water detention basin that would eventually become the storm water detention pond for the operating facility. (See Attachment 3 showing storm water

[24] David M. Lee, WEPCO, letter to Ben Callan, DNR, May 26, 2010. PSC REF #132257.
[25] "Domtar Biomass Project Floodplain Analysis." Appendix Q of the CA application, PSC REF #128347.

pond). The effects of vehicular traffic would be controlled with stone tracking pads and tire washing. The applicant has also applied to DNR for storm water and erosion control permits, including permission to install the detention pond on the south end of the Domtar property near River Street.

Borings also have not yet indicated any major site contamination or remediation needs. WEPCO notes in its application that there may be pockets of oil-contaminated soil from past truck traffic in the area. In a Phase I environmental site assessment report,[26] Domtar indicated that heavy diesel and rail equipment use in the area over the years had resulted in some petroleum product releases, and also that stained surface soils had been removed in the past and a potential for residual impacts could still exist beneath the concrete floor of a chip pit garage area at the site. It also indicated that the area had been periodically graded and covered with road fill, so some contamination might be buried. If contaminated soils were found during construction, the company would be required to have them remediated in accordance with applicable law in consultation with DNR. The location for the plant now includes two above-ground diesel storage tanks with secondary containment, one above-ground propane tank, and two transformers. DNR records show groundwater contamination at levels greater than standards in Wis. Admin. Code ch. NR 140, and the consultant recommends sampling for lead and other metals.

Attachment 4 illustrates the relative amounts of paved and green areas on the plant site after construction.[27] All of the biomass facilities would be surrounded by new bituminous pavement.

There are also several older buildings where demolition could result in the need to dispose of lead paint and asbestos residues.

Slightly less than one-half mile of high-voltage electric transmission line would need to be built if WEPCO selects the ATC option for the transmission connection to the project. The line would run from a new ATC substation on the Domtar property across the Wisconsin River just upriver from the existing bike/footbridge, through an existing woodland on the other side of the river, around a residential area, and across I-39 to the existing 115 kV transmission line east of the highway, where the new line would be tapped into the existing line. (See Attachment 5.[28]) The crossing of the river would require a structure to be built on or near each bank. About 1,180 linear feet of woodland would have to be cleared. The ROW would be between 80 and 100 feet wide, so the cleared woodland area would range from about 94,400 square feet (about 2.17 acres) to about 118,000 square feet (about 2.71 acres) overall. Some of forested area that might be cleared is actually wooded wetland. About 285 linear feet of the line would cross wooded wetland. The cleared ROW through wooded wetland would range from about 22,800 square feet (about 0.52 acres) to about 28,500 square feet (about 0.65 acres).

ATC would be responsible for building the line and clearing the ROW. The line would cross the river without placing any structures in the river itself. The main impact would be the visual feature seen by river users. On the other end of the proposed line, the crossing of I-39 would require permission from DOT. The cleared ROW would add another corridor through the woods just north of the bicycle path, fragmenting the woodland along the riverbank again and creating more edge habitat. The amount of interior woodland habitat would decrease and the ability of this

[26] Terra Tec Engineering. *Phase I Environmental Site Assessment Report*. In Appendix V of the CA application.
[27] CA application, Supplement to TSD Appendix H, Local Permits, Notices and Approvals Part One, "Presentation Site Landscape Plan," PSC REF #135784.
[28] CA Application, Appendix J, Exhibit 2A, "Facilities Map," PSC REF #128341.

wooded tract to support species that require interior forest habitat would also decline. Where the wooded wetland would be cleared, the adjacent wetlands beneath the tree canopy would be exposed to direct sunlight, which would likely cause some drying and/or warming of the wetland. The drying and warming would result in habitation by different plant and animal species, and a loss of habitat for those species depending on a wetter, cooler, tree-covered environment.

No archeological or historic properties appear to be in the project area. Two archeological sites inventoried with the Wisconsin Historical Society (WHS) are located across the river. If the ATC transmission option is selected, these would have to be avoided if possible.

2.2 Potential Operating Impacts

Overview

The new facility would be built on an existing industrial site and share infrastructure and resources with the mill and provide increased efficiency in operation. This section discusses the impacts of operating the Rothschild plant on the Domtar property. This section does not address the potential impacts of acquiring the biomass fuel, which are considered and evaluated in Section 2.3.

The new facilities would be located on the south end of the Domtar property, taking up about 13.3 acres, and integrated with the existing Domtar pulping and water processing facilities, replacing three Domtar boilers that currently burn natural gas and distillate oil and a fourth boiler that burns "mixed solid fuel." The facilities would be built to be compatible with the paper mill's existing pulping operation, receiving pulping waste wood materials by conveyor from the mill, using Domtar's existing water intake and water discharge facilities, and sharing Domtar's existing southeast side mill entranceway. There would be few electric transmission system changes needed, particularly if the existing WPSC 46 kV connection to the mill is used, and the current electric system reliability would be maintained. Current zoning on the site is I-2, Heavy Industrial. While some variances needed to be requested from the village, the village has approved them.

The new facilities would be directly adjacent to an existing residential neighborhood and park to the south and across Business USH 51 from a larger residential neighborhood to the east. The new plant would lie about 3,000 feet southwest of the existing Rothschild Elementary School. WEPCO states in its application that there are no other schools within a half mile of the site and no day care centers, hospitals, or nursing homes. Local residents, however, are concerned about Saint Mark's parochial grade school just over a half mile to the southeast, and the DC Everest Area School District has expressed concern about the proximity of the project to DC Everest Junior High School.

There would be a number of potentially adverse impacts that could result from operation of the CFB boiler at the new plant. WEPCO argues that the CFB boiler is a relatively mature technology that is reliable and the most efficient available for this plant's needs. Regardless, the combustion of biomass would result in the production of ash, emission of air pollutants, and consumption of water with possible local fogging and icing. There would also be a large increase in truck deliveries of fuel for the boiler. Several of these impacts could be cumulative impacts adding to existing impacts of other local industries including the WPSC Weston Generating Station to the south along the Wisconsin River. Potential impacts are discussed in separate sections below.

All the studies provided by the applicant show that there appears to be an adequate and available fuel supply. WEPCO and Domtar commissioned several studies examining the potential for

feasible biomass fuel supply.[29] The studies have been performed by different consultants and have varying scopes. Biomass fuel supply impact issues are discussed below in Section 2.3.

2.2.1 Air emissions

This section addresses the status of the DNR air permit process at the time of PSC EA preparation and also addresses potential impacts due to greenhouse gases (GHG) and truck emissions.

> ***Note**: DNR is preparing an EA before action on the air pollution permit application is taken. The DNR EA could include more detailed or up-to-date air emissions information.*

2.2.1.1 Criteria pollutants

Because of the adverse impacts of air pollutant emissions on health, welfare, and the environment, federal and state laws are implemented to reduce emissions to levels that research has shown would protect the majority of individuals and reduce overall impacts on ecosystems. The U.S. Environmental Protection Agency (EPA) has established National Ambient Air Quality Standards (NAAQS) to regulate the emissions of six "criteria" pollutants: carbon monoxide (CO), nitrogen oxides (NO_x), ozone (O_3), lead, particulates (PM, PM_{10}, $PM_{2.5}$), and sulfur dioxide (SO_2). The standards are based on EPA's interpretations of health impact research related to those pollutants. The NAAQS levels are set by EPA with the intent to protect not only the general population, but also so-called "susceptible populations," individuals with asthma, young children, and the elderly. To achieve this level of protection, EPA requires that modeling for new facilities' air pollution control permits be performed at the maximum allowable emission level that would be permitted. The required emission level for the modeling to obtain a permit would be a level that could never be realized in actual operation. The requirement would assume that the boiler would operate every hour of the year at 102 percent of capacity at its maximum permitted emissions level. Five years of meteorology data would also be required for the model to evaluate worst-case meteorological conditions.

State air permits regulate the emissions of the six criteria pollutants and other classes of pollutants in Wisconsin. Some criteria pollutants require a different approach than the others. Ozone is generally controlled by controlling the emission of nitrogen oxides (NO_x) and volatile organic compounds (VOC) that react with NO_x to form O_3. $PM_{2.5}$ particles are emitted directly and are formed chemically in the atmosphere, mostly from NO_x and SO_2. Power plants do not generally emit large quantities of lead, but are notable emitters of several other criteria pollutants. Lead emissions do not appear to be an issue for this project.

For this project, greenhouse gas emissions will be considered in the permit review as well. Treatment of greenhouse gases is discussed below in Section 2.2.1.4.

The criteria pollutants are controlled mostly by application of Best Available Control Technologies (BACT) that bring each pollutant's level below a certain limited emission rate. The company has proposed control technologies, and DNR will approve or modify them after doing its own modeling and analyses.

- For NO_x emission control, BACT appears to be the CFB itself plus selective non-catalytic reduction.
- For SO_2, BACT appears to be the CFB plus the use of low sulfur biomass fuels.

[29] Provided in Appendix O of the project application, PSC REF #128367 and #128368 for redacted versions, and #128365 and #128366 with confidential information.

- For PM and PM_{10}, BACT would be a fabric filter baghouse and, for $PM_{2.5}$ from the boiler, BACT would be the baghouse with felted filter media.
- For VOCs and for CO, BACT would be the CFB itself and good combustion practices.

The project requires air pollution control construction and operation permits from DNR. DNR review of the air permit applications is in process; this review will verify or alter expectations.

> ***Note**: Under Wis. Admin. Code NR 150, DNR must prepare an environmental assessment for an air pollution control permit where the potential for increased emissions of criteria pollutants would be 100 tons or more per year after controls. DNR is preparing an EA before action on the air pollution permit application is taken. The DNR EA could include more detailed or up-to-date air emissions information.*

WEPCO states that the operation of the new CFB boiler and retirement of the existing Domtar boilers would result in a decrease in overall emissions by about 30 percent. It provides two tables in the project application Technical Support Document[30] that add up the measured tons per year of criteria pollutants emitted from Domtar's existing boilers and the estimated tons per year expected from the CFB, showing a 30 percent decrease in overall pollutant tons per year while producing slightly more British thermal units (Btu) per hour. After showing WEPCO's expected maximum allowable emission limits with the expected BACT for the individual pollutants,[31] the Technical Support Document provides the highest modeled air concentrations at any receptor that would result in Marathon County in micrograms per cubic meter.[32] These concentrations must be compared with EPA-defined "significant impact levels" (SIL) to see which pollutants must go through a NAAQS analysis.

Table 3 summarizes the changes in criteria pollutant emissions (excluding lead[33]) predicted by WEPCO in the CA application Technical Support Document. As DNR review of the air pollution control permit proceeds, these values might change.

Table 3 Current air pollutant emission rates at the Rothschild Domtar mill and WEPCO's expected rates if proposed CFB project is approved, in tons per year

Pollutant	Current Domtar Actual Emission Rate (tons per year)[34]	Expected WEPCO CFB Actual Emission Rate[35] (tons per year)	Estimated Maximum Allowable Emissions for Entire Proposed Project, Representing BACT[36] (tons per year)
NO_x	396	172	372
CO	230	218	766
SO_2	1.4	5	316
PM and PM_{10}	20	46	121
$PM_{2.5}$			93
VOCs	16	16	66

[30] Technical Support Document, p. 54, Tables 2.18-1 and 2.18-2.
[31] *Ibid*, p. 59, Table 2.18-6.
[32] *Ibid*, p. 63, Table 2.18-9.
[33] Lead is not a pollutant emitted in large amounts by power plant boiler systems burning coal, natural gas, or biomass.
[34] Data from WEPCO application, p. 54, Table 2.18-1.
[35] Information from WEPCO project application, Section 2.18, p. 54, Table 2.18-2.
[36] Data from WEPCO project application, Section 2.18, p. 59, Table 2.18-6. Includes CFB boiler and natural gas-fueled auxiliary package boiler plus diesel-powered feedwater pump, material handling systems, and cooling towers.

The SILs are defined by EPA in air concentrations of micrograms per cubic meter ($\mu g/m^3$) for the pollutants over certain established averaging periods during which they have been shown to have effects. EPA-defined SILs currently exist for PM_{10}, CO, SO_2, and the annual NO_2 NAAQS, again based on interpretations of health impact research related to those pollutants. It is EPA's policy to exempt proposed pollution sources from conducting comprehensive, multisource modeling if their estimated maximum ambient impacts for a given pollutant are less than the SIL. In practice, if the modeled ambient impacts from a proposed project are less than the respective SIL, it is presumed that the project will not cause or significantly contribute to a PSD increment or NAAQS violation. For this reason, the project applicant would not be required to perform multiple source cumulative impact assessments for that particular pollutant. Exceeding those SIL concentrations, however, triggers a NAAQS air dispersal analysis. WEPCO's application shows SILs not exceeded for: 8-hour and 1-hour concentrations of CO; annual concentrations of NO_x; and annual concentrations of SO_2. Because their SILs were not exceeded, those pollutants and averaging intervals were not pursued by the company in the cumulative dispersion modeling analysis. Those pollutants and averaging intervals where concentrations exceeded the SILs were carried through the NAAQS analysis.[37]

Table 4 summarizes the pollutant dispersion modeling results and how the resulting air concentrations approach the NAAQS, as provided by WEPCO in its application materials.[38] TSP stands for total suspended particulates.

Table 4 WEPCO's estimated expected cumulative air concentrations and existing background concentrations of criteria pollutants compared with NAAQS, in micrograms per cubic meter ($\mu g/m^3$)

Pollutant	Averaging Interval	Cumulative Concentration Impact	Background Concentration	Total Concentration	NAAQS	Percentage of NAAQS
NO_x	1-hour	61	12	73	188	39%
SO_2	24-hour	249	11	260	365	71%
SO_2	3-hour	951	12	963	1300	74%
PM_{10}	24-hour	42	29	71	150	47%
$PM_{2.5}$	Annual	2	9	11	15	73%
$PM_{2.5}$	24-hour	9	26	35	35	99%
TSP	24-hour	104	40	143	150	96%
Lead	3-month	0.00066	0.01	0.01	0.15	7%

The NAAQS model factors in how the site layout and stack design maximize dispersion, using algorithms developed by EPA. As a result, the modeled emissions summarized in Table 4 give a more accurate picture of the impacts of plant emissions on air quality than the maximum allowable stack emission numbers shown in Table 3. Also, the modeled air concentrations in $\mu g/m^3$ are based on all the allowable emission rates in the area and the dispersion modeling algorithms, so there is no direct correlation between the allowable emissions in tons per year, or expected emissions in tons per year, and the maximum predicted air concentrations in $\mu g/m^3$. As can be seen in Table 4, TSP and $PM_{2.5}$ would reach concentrations within 96 and 99 percent of their NAAQS, respectively.

[37] Annual concentrations of PM_{10} appeared in the CA application and air permit application to exceed the SIL. Annual PM_{10} is not included in the modeling because the state Natural Resources Board adopted the $PM_{2.5}$ NAAQS and repealed the annual PM_{10} NAAQS in 2009.

[38] Information provided by WEPCO in Technical Support Document, pages 62- 64, Table 2.18-10; and Prevention of Significant Deterioration Air Pollution Control Construction Permit Application, pp. 51-54, Table 7.3. "Cumulative impacts" include air concentrations resulting from the proposed sources plus existing nearby sources as provided by DNR.

These expected concentrations are close to violation of the NAAQS and might likely be the most logical pollutant situations to watch during plant operation.

One can see that the current ambient air modeling for this proposed project shows impacts similar to the current operations at Domtar while WEPCO's projected estimated overall actual emissions are 30 percent less. According to DNR, there are several factors that may influence this apparent discrepancy.[39] The modeling previously done for the current operations at Domtar have taken into account the existing layout of the facility, stack locations and parameters like height and exit velocity, allowable emission rates and operational factors like allowed hours of operation for the existing units, and the use of the then-approved air dispersion model software ISCST3. The modeling performed for the proposed WEPCO project would take into account the same factors but also utilize new, more rigorous, modeling software (AERMOD). The differences in the facility layout, stack locations and parameters, and allowable emission rates or operational factors for the proposed units would all play a role in how the impacts might change and whether they might increase, decrease, or stay relatively the same. Therefore, it is not a one-to-one comparison based solely on emissions. Furthermore, the WEPCO-projected 30 percent reduction appears to be accounted on the actual emissions. "Actual" emission differs from the emissions utilized in an air dispersion model. The model utilizes "allowable" emission rates, which are normally much higher than expected or actual emissions. DNR staff point out that no direct comparison can be made between the projected 30 percent reduction in expected actual emissions and the projected allowable emissions because of the multiple factors utilized in an air dispersion analysis.

A county where monitoring data has resulted in a design value greater than the NAAQS is designated as a non-attainment county. Along with the obvious public health concern, being designated non-attainment may have an adverse impact on economic development of an area. Any major modification or major new emissions source would have to install the very best control equipment and find offsets for new emissions. DNR has anecdotal evidence suggesting that industrial sources looking to expand appear to avoid designated non-attainment areas.[40]

Regardless of whether the facility's emissions meet the NAAQS, there is often a question of whether more sensitive individuals are adequately protected. In general, when air pollution levels increase, sensitive individuals might experience adverse respiratory symptoms. The most vulnerable members of a population are generally the young, the elderly, and the infirm. Members of the public who are most susceptible to environmental stress can often be found in hospitals, schools, daycare centers, and retirement homes. Two elementary schools are located just over a half mile to the north and east of the project site. At least one, Rothschild Elementary School, has no central air conditioning system and must have the windows open during warm days.

It might also be noted that the American Lung Association president wrote last year to U.S. Representatives Henry Waxman and Edward Markey, commenting on their legislative initiative for address global climate change and energy policy, and stated that,

> "The Lung Association urges that the legislation not promote the combustion of biomass. Burning biomass could lead to significant increases in emissions of nitrogen oxides, particulate matter and sulfur dioxide and have severe impacts on the health of children, older adults, and people with lung diseases."[41]

[39] Private communication with Jeffrey Johnson, DNR Air Bureau. August 10, 2010.
[40] Public Service Commission/Department of Natural Resources joint Final Environmental Impact Statement for the WP&L 300 MW Power Plant, PSC docket 6680-CE-170, p. 153.
[41] Charles D. Connor, President and CEO, American Lung Association, letter to U.S. Representatives Henry Waxman and Edward Markey. June 24, 2009.

Again, the NAAQS are based on EPA's interpretations of scientific health impact research related to those pollutants. Their purpose at EPA is to protect not only the general population but also susceptible or more vulnerable populations, such as individuals with asthma, young children, and the elderly.

2.2.1.2 Hazardous air pollutants (HAP) including mercury

Hazardous air pollutants are a special classification of pollutants known also as toxic air pollutants or air toxics under the Clean Air Act. The Clean Air Act requires EPA to reduce the routine daily emissions of air toxics first by a technology-based approach, and EPA has created Maximum Achievable Control Technology (MACT) standards for each major type of facility within an industry group. The standards are based on emissions levels that are already being achieved by the better-controlled and lower-emitting sources in an industry (in this case, utility steam-electric generating units). The standards are enforced under the Clean Air Act (and Wis. Admin. Code ch. NR 445) as case-by-case MACT for projects that would reach threshold levels qualifying them as "major sources." The emission of each HAP is being modeled by the DNR Air Bureau and adjusted to limits that the DNR and EPA determine are appropriate. Permittable emission levels are expected to be low enough to protect human health according to the EPA.

A major source of HAPs under the federal Clean Air Act[42] is one that emits at least 10 tons per year of any individual HAP or more than 25 tons per year of the combined HAP emissions. Wis. Admin. Code ch. NR 445 lists and covers all federal HAPs plus several "state-only" HAPs that are not considered under the above thresholds. WEPCO offers four categories of HAPs expected to be emitted from the project: inorganic solid phase HAPs, inorganic acid-gas phase HAPs, organic HAPs, and mercury. While the natural gas-fired auxiliary boiler would emit a total of about one ton per year of all HAPs combined, the CFB would emit enough total HAPs per year to qualify it as a major source of HAPs. WEPCO has applied case-by-case MACT in its air permit application materials. MACT would be applied to control emissions of all federal HAPs from the proposed project. The situation for ammonia, not a federal HAP, is discussed below. The CFB would be classified as an industrial boiler because it would not combust fossil fuels in greater than a threshold amount.

Inorganic solid phase HAPs, including heavy metals of concern, are listed in Table 5 and proposed in the company's permit application to be controlled with the fabric filter baghouse installed in front of the stack.

Table 5 Estimated potential emissions of inorganic, solid-phase HAPs predicted by WEPCO in tons per year

HAP	Potential to Emit (tons per year)
Antimony	0.028
Arsenic	0.077
Beryllium	0.004
Cadmium	0.014
Chromium	0.086
Cobalt	0.023
Lead	0.168
Manganese	5.606
Nickel	0.116
Phosphorus	0.095
Selenium	0.010

[42] Section 112(b) of the Clean Air Act.

Inorganic acid gases are essentially hydrogen chloride (as HCl) and hydrogen fluoride (as HF) and are also to be controlled with the fabric filter baghouse. Both acids are corrosive. The project would be required to emit no more than about 14 tons per year of HCl gas and about 4 tons per year of HF gas. Recently-published EPA-proposed industrial boiler MACT rules require the new MACT standard for HCl.

The organic HAPs that would be emitted by the CFB boiler are listed in Table 6. All qualifying HAPs are listed in this table because they were indicated to be emitted in absolute amounts even if their potential emissions round off to 0.0 tons per year to the nearest tenth of a ton. (Thus 0.0 tons per year can be translated as less than half a ton per year.) Organic HAPs of concern are more numerous than the inorganic solid phase HAPs and include the individual HAPs that triggered the case-by-case MACT requirement (bolded in the table). WEPCO's application proposes "good combustion practices" as MACT for organic HAPs. Its proposed CO and VOC emission limits represent MACT limits. The total HAPs expected to be emitted by the next biggest source on the project, the natural gas-fired boiler, would total about one ton per year.

Table 6 Estimated potential emissions of organic HAPs for the CFB boiler, in tons per year rounded to the nearest tenth of a ton[43]

HAP	Potential to Emit (tons per year)	HAP	Potential to Emit (tons per year)
Acetaldehyde	2.9	1,2-Dichloroethane (EDC)	0.1
Acetophenone	0.0	Dichloromethane	1.0
Acrolein	0.3	1,2-Dichloropropane	0.1
Benzene	2.6	2,4-Dinitrophenol	0.0
Benzo(a)anthracene	0.0	Ethyl benzene	0.1
Benzo(a)pyrene	0.0	Formaldehyde	2.2
Benzo(b)fluoranthene	0.0	Indeno(1,2,3,c,d)pyrene	0.0
Benzo(e)pyrene	0.0	2-Methylnaphthalene	0.0
Benzo(g,h,i)perylene	0.0	Naphthalene	0.3
Benzo(j,k)fluoranthene	0.0	4-Nitrophenol	0.0
Benzo(k)fluoranthene	0.0	Pentachlorophenol (PCP)	0.0
Bis(2-ethylhexyl)phthalate	0.0	Phenol	0.2
Bromomethane (methyl bromide)	0.1	Propanal (propionaldehyde)	0.0
2-Butanone (MEK)	0.0	Propionaldehyde	0.2
Carbon tetrachloride	0.2	Styrene	6.7
Chlorine	2.8	Tetrachloroethene (perchloroethylene)	0.1
Chlorobenzene	0.1	Toluene	3.2
Chloroform	0.1	1,1,1-Trichloroethane	0.1
Chloromethane (methyl chloride)	0.1	Trichloroethene	0.1
Dibenzo(a,h)anthracene	0.0	Trichlorofluoromethane (CFC-11)	0.1
1,2-Dibromoethene	0.2	2,4,6-Trichlorophenol	0.0
Polychlorinated biphenyls (PCBs)	0.0	Vinyl chloride	0.1
2,3,7,8 TCDD equivalents (dioxins and furans)	0.0	o-Xylene	0.1

[43] The emissions estimates in Table 6 are from WEPCO response to Commission staff data request 3.08. The applicant has estimated HAP emissions from the facility by applying the limits in the June 4, 2010 proposed industrial boiler MACT. On August 18, the Governor and DNR Secretary submitted comments to the EPA on its proposed industrial boiler MACT rule, requesting revisions to the EPA's approach to MACT for biomass boilers. It is possible that the final industrial boiler MACT rule will include different standards for biomass-fired plants than those included in the proposed MACT standard. Estimated levels for organic HAPs with currently proposed MACT standards that would result in less than 0.5 tons per year appear as 0.0 in Table 6.

Benzene and formaldehyde both would be emitted in amounts over 10 tons per year in WEPCO's original air pollution control permit and so would trigger the need for WEPCO to do a case-by-case MACT on HAPs. However, the emission factors for benzene and formaldehyde have been updated by EPA for industrial boiler MACT standards, and WEPCO's new estimates based on the new MACT standards would each be less than 10 tons per year.[44] Based on these updates and others, WEPCO's states that its total summed potential HAP emissions would be reduced from 122.2 tons per year in its original air permit application to 52.7 tons per year. This total would still trigger the need for case-by-case MACT, so WEPCO has applied MACT in its application. MACT analyses are being performed by the DNR Air Management Bureau as part of the air permit review at the DNR.

Mercury is an air toxin of great concern and is regulated particularly under Wis. Admin. Code ch. NR 446 but also subject to case-by-case MACT. Mercury may be an issue with tree bark because trees have taken it into their systems. Currently, over 300 Wisconsin lakes and river stretches carry fish consumption advisories for mercury. Mercury accumulation in fish-consuming wildlife can lead to reproductive problems. Human consumption of fish that contain mercury can damage the nervous system, especially in children and fetuses. Mercury emissions may not exceed 2.9 pounds per trillion Btu from the boiler. CFB emissions of mercury would be controlled with the fabric filter baghouse according to the WEPCO air permit application. EPA recently proposed national emission standards for control of mercury emissions from biomass-fired area source boilers and for other hazardous air pollutants based on EPA's proposed determination about what constitutes the generally available control technology or management practices. DNR is planning to use the EPA-proposed biomass MACT as MACT for the proposed boiler, unless WEPCO shows how it does not represent new source MACT for the project.[45] The recently-published EPA-proposed industrial boiler MACT rules include an updated MACT standard for mercury. With that update, the precise estimate of mercury emissions in WEPCO's air permit application has been updated from 0.010 tons per year to 0.0007 tons per year.

Local citizens have expressed concerns about dioxins and furans being produced as organic HAPs byproducts of the biomass combustion. According to WEPCO's air pollution permit application, and as seen in Table 6, dioxins and furans would be produced. Trace amounts of dioxins and furans are emitted from any combustion process, including biomass combustion. They are already produced by the existing Domtar mill at the level of nanograms per kilogram of mill sludge as well. These products are distributed mainly through the air, enter our system when we eat contaminated food, and typically stay and build up in the fatty tissues of animals.[46] Potential effects of dioxins and furans in humans include cancer and changes in hormone levels. The recently-published EPA-proposed industrial boiler MACT rules include updated HAP limits for some MACT standards, including that for dioxin/furan emissions. The dioxin/furan MACT standard will likely be 1.5 x 10-10, or 0.00000000015 tons per year. To the nearest tenth of a ton per year, this level appears as zero in Table 4. It is less than one percent of one pound. According to WEPCO's air permit application, dioxin and furan emissions from the CFB boiler would be minimized by good boiler design and good combustion control, which minimizes precursor formation. This control method also minimizes emissions of other organic hazardous air pollutants such as formaldehyde.

[44] Table 6.2 of WEPCO's Air Pollution Control Construction Permit, on HAPs, was revised 7/9/2010. PSC REF #134769.
[45] Letter from Steven Dunn, DNR Air Bureau, to Terry Coughlin, WEPCO. June 30, 2010.
[46] EPA Dioxins and Furans Fact Sheet. www.epa.gov/osw/hazard/wastemin/minimize/factshts/dioxfura.pdf.

Applying the emission limits from the EPA's proposed industrial boiler MACT standards, potential dioxin/furan emissions from the CFB boiler would be 0.00000031 pounds per year (or 310 billionths of a pound). WEPCO must compare this emission rate to the most toxic members of the category: 2,3,7,8-tetrachlorodibenzo-p-dioxin and 1,2,3,7,8-pentachlorodibenzo-p-dioxin. The comparison is stated as Toxic Equivalency (TEQ). DNR's threshold emission rate for dioxins and furans under Wis. Admin. Code § NR 445.07, Table A, is 0. 0001 pounds per year TEQ. The above potential dioxin/furan emissions from the CFB boiler would be less than 1/300th of the threshold amount for DNR regulation under Wis. Admin. Code ch. NR 445. So, expected potential dioxin and furan emissions would be far below the threshold level that would require regulation under the health-based air toxics rules in NR 445. The estimated levels may change as the DNR processes WEPCO's permit application.

Ammonia, which is not a federal HAP, would be emitted by the project as a result of "ammonia slip" from the SNCR NO_x control system. In its air permit application, WEPCO estimates ammonia emissions from the stack to be about 122,303 pounds per year (about 61 tons per year). This level is lower than the threshold for state action in Wis. Admin. Code § NR 445.07.

2.2.1.3 Dust and particulate matter

According to the CA application, the plant's fuel conveyor and processing systems would have dust collection systems installed at transfer and processing points as WEPCO's proposed BACT. Air collected at these points would run through a fabric filter baghouse to remove particulates before being exhausted to the atmosphere. According to Appendix C of the air pollution control construction permit application,[47] emissions of PM and PM_{10} are estimated to be controlled to about 16 tons per year each and emissions of $PM_{2.5}$ would total about 8.2 tons per year. These levels might be lower after the company and DNR refine the expected emissions while DNR processes the permit application.

WEPCO's air permit application describes its proposed BACT for the biomass truck unloading as a self-unloading truck system in combination with a wet dust suppression system. The wet dust suppression system does not induce an air flow out of the unloading enclosure and so reduces the amount of PM emitted. The combined use of the enclosure and the wet dust collection system would keep total PM emitted at about 538 pounds per year.

Conducting biomass storage and reclaim inside a building, which WEPCO is proposing as BACT, would reduce PM emissions by over 90 percent from what they would be outside. The storage silos would have vent filters, as would the ash handling and storage silo system.

WEPCO also proposes to pave all roadways and use dust suppression on roads when necessary as BACT to control fugitive dust. The company expects that this would reduce dust by about 85 percent over doing nothing. The company estimates emissions of $PM_{2.5}$ to be about 0.41 tons per year on biomass fuel delivery roads and about 0.0015 tons per year on ash truck roads. Emissions of PM_{10} would be about 0.276 tons per year on biomass delivery roads and about 0.0104 tons per year on ash truck roads. Emissions of PM otherwise would be about 1.417 tons per year on biomass delivery truck roads and about 0.0533 tons per year on ash truck roads.

[47] PSC REF #132222. A copy of the permit application and permit-related correspondence to date has been filed as a supplement to Technical Support Document Appendix G, State Permits, Notices and Approvals (PSC REF #132184).

A small amount of particulate matter would also be emitted from the cooling towers as droplets that drift through the system evaporate. The company indicates that PM emissions would be at about 0.386 tons per year, PM_{10} emissions would be at about 0.317 tons per year, and $PM_{2.5}$ emissions would be at about 0.00087 tons per year. WEPCO's plan is to use high efficiency droplet drift eliminators to control PM to these levels.

2.2.1.4 Greenhouse gases

GHGs would be emitted by the project during operation. Potential impacts of GHG emissions on global climate change and its potential effects are described in the reports of the Intergovernmental Panel on Climate Change, the scientific body set up by the World Meteorological Organization and the United Nations Environment Programme to provide an objective source of information about global climate change.[48] Potential impacts worldwide and in Wisconsin, including costs of mitigation, are summarized in the environmental impact statement issued in 2008 that discusses Wisconsin Power and Light Company's (WP&L) proposed Nelson E. Dewey Generating Station Unit 3.[49]

Carbon dioxide (CO_2) and nitrous oxide (N_2O), which would comprise most of the GHG emitted from the CFB boiler, are discussed in this subsection.[50] Other GHGs include methane (CH_4) and fluorocarbons. In response to staff data requests, WEPCO provided information about GHG emissions with the caveat that its understanding is that the CFB boiler burning biomass would be "carbon neutral." As shown in Table 7 below, the CFB would emit 590,000 tons of CO_2 per year. This emission rate for the plant's proposed energy output would be equivalent to 1,815 pounds per MWh. That rate could compare with 1,853 pounds per MWh for the relatively new Weston Unit 4 supercritical pulverized coal-fired boiler. WEPCO points out that the commonly recognized difference between a biomass and coal plant is that carbon released from combustion of biomass is presumed to be absorbed or "resequestered" by other biomass as it grows, making the biomass plant "carbon neutral." A discussion of the carbon neutral argument is below. In Table 7, the emission levels are shown in tons per year and CO_2 equivalents (CO_{2e}). The global warming potential of N_2O emissions is 310 times that of CO_2, so N_2O emissions are also given as CO_{2e}.

Table 7 WEPCO estimates of CO_2 and N_2O emissions in tons per year from the proposed project, including N_2O as CO_2 equivalents

Greenhouse Gas	CFB Boiler Emission		Natural Gas Auxiliary Boiler Emission		Diesel Feedwater Pump Emission
	Tons/yr emitted	Tons/yr CO_{2e}	Tons/yr emitted	Tons/yr CO_{2e}	
CO_2	590,000	590,000	13,000	13,000	17
N_2O	39	12,090	0.2	62	-
Total CO_{2e}		602,090		13,062	17

Adding up total tons per year in CO_{2e} from the plant results in a total of 615,169 tons of CO_{2e}.

Commission engineering staff has performed modeling analyses on several generation alternatives to this plant using the following assumptions:

[48] For example, *Climate Change 2007: Synthesis Report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental panel on Climate Change*.
[49] Public Service Commission of Wisconsin and Wisconsin Department of Natural Resources. *WP&L 300 MW Power Plant Final Environmental Impact Statement.* PSC docket 6680-CE-170. July 2008, pp. 135-152.
[50] Although N_2O is an oxide of nitrogen, it is not a criteria pollutant. Wis. Admin. Code § NR 400.02(107) defines NO_x as "all oxides of nitrogen except nitrous oxide."

- the CO_2 emissions would be five percent greater than WEPCO's estimate to account for the presence of running diesel trucks on the plant site
- the N_2O emissions would be twice the amount estimated by WEPCO because of uncertainties related to the choice of a CFB boiler

The intervener SOAR has suggested that the additional impact of N_2O emissions on the total CO_{2e} should be notably greater, but WEPCO's information and Commission engineering staff adjustments both seem to result in N_2O emissions being a small percentage of the total CFB boiler emissions. If WEPCO's estimated N_2O emissions from the CFB boiler are included in CO_{2e}, the amount of CO_{2e} from the CFB boiler increases by approximately two percent. If they are doubled, as in the engineering staff modeling, the amount increases by approximately four percent. If the CO_2 emissions are increased by five percent to account for trucks as part of the CFB emissions, the total CO_{2e} emitted increases to 619,500 tons but the doubled emission estimate of N_2O would still be approximately four percent of the CFB CO_2 output.

The final determination of N_2O and CO_{2e} emission limits will, as discussed below, be part of the DNR air pollution control permit.

The following discussion is primarily based on CO_2 or its surrogate term, "carbon."

GHGs, including CO_2, are now considered by the EPA to be pollutants covered under the Prevention of Significant Deterioration (PSD) and Title V programs of the Clean Air Act (CAA). Under the recently issued EPA Greenhouse Gas Tailoring Rule, a project emitting over 75,000 tons of GHGs per year in CO_{2e} would be required to obtain a permit with BACT and comply with existing PSD regulations for CO_{2e} under the Clean Air Act as of January 2, 2011 if the project was also significantly increasing emissions of at least one non-GHG pollutant. To obtain the permit, the facility would have to demonstrate that it was using the best practices and technologies available to minimize GHG emissions. The permit would be part of the state's air pollution control permitting. The Tailoring Rule set the threshold for GHG emissions as a criteria pollutant at a level high enough to be seen as a feasible level for enforcement.

At this time, the Tailoring Rule provides little distinction between biomass-fired power plants and coal-fired power plants, but the biomass industry is striving to effect rule changes that would avoid disincentivizing biomass power.[51] The EPA has issued a Call for Information[52] that serves as a first step in considering separate options for addressing emissions of biogenic CO_2 under the PSD and Title V programs. The Call's purpose is to request comments on how a different approach for biomass plant emissions might be developed for the PSD and Title V Programs, and to solicit information about biomass-fired sources and their emissions, technical methods of accounting for these emissions, and the underlying science that might help develop possible accounting approaches.

In Wisconsin, the regulation of GHG emissions by the EPA will be done through the state DNR air pollution control permitting process. It is expected that GHG will be addressed in the DNR air pollution control permit for this project. At this time, the proposed project emissions would exceed

[51] Dixon, Darius. "Industry claims emissions rule could devastate future of biomass." Greenwire. June 9, 2010. Bravender, Robin. "Biomass industry sees 'chilling message' in EPA emissions rule." Greenwire. May 14, 2010.
[52] U.S. Environmental Protection Agency. Call for Information: Information on Greenhouse Gas Emissions Associated with Bioenergy and Other Biogenic Sources. Docket ID No.EPA-HQ-OAR-2010-0560.

the criteria threshold under the pending federal law and require the company's air permit to apply BACT as of January 2011.

At the time of preparation of this EA neither CO_2 nor N_2O are regulated under the Clean Air Act or Wisconsin Administrative Code. There are no specific control requirements for the proposed CFB boiler and no other similar facility available for comparison that has GHG controls classified as BACT. However, the Wisconsin DNR is intending to apply BACT for GHGs in the air pollution control permit for the Rothschild biomass facility. The draft air permit is expected to be completed in mid-November, 2010.[53] (The draft EA by DNR staff is expected to be issued about the same time.[54])

As stated above, WEPCO has maintained that biomass energy is considered carbon neutral in Wisconsin, meaning that carbon released from combustion of biomass is presumed to be absorbed or captured by other biomass as it grows. No clear declaration of Wisconsin state government policy on biomass energy could be found, but WEPCO points out that the Governor's Task Force on Global Warming (GWTF) and proposed federal legislation treat biomass as carbon neutral. However, EPA intends to regulate GHG emissions from biomass-fired power plants starting in January 2011, and thus does not appear to consider biomass combustion to be carbon-neutral at this time.

The concept of "carbon neutral" in this context may be more complicated than recognized at first glance. The GWTF's Biomass and Biofuel Recommendation includes this *caveat*:

> "Some bioenergy feedstocks, conversion technologies, and end uses have lower life-cycle carbon emissions than others. It is therefore the intent of this policy proposal to promote those bioenergy sources with the most favorable life-cycle carbon emissions. In crafting specific policies, the relative efficiency and carbon emission impact of biomass must be evaluated."[55]

The recent report by the Manomet Center for Conservation Sciences, commissioned by the state of Massachusetts, cites the 2009 status report of the International Energy Agency (IEA) as the state-of-the-art thinking on the impacts of forest biomass combustion on GHGs.[56] The IEA points out that the amount of GHG emission reduction from biomass harvest and use options is "complicated by the fact that the performance of the different options is site-specific and is determined by many parameters." The more critical parameters that affect relative GHG emissions reduction from forest biomass include:

- The productivity and regenerative ability of the biomass harvest site and the efficiency with which the harvested material would be used;
- The fossil fuel system that would be replaced;

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[53] Steven Dunn, DNR Air Management Program, personal communication, October 6, 2010.
[54] Thomas Lovejoy. DNR Environmental Analysis and Review Supervisor, personal communication, October 6, 2010.
[55] Final Report of the Governor's Task Force on Global Warming: *Wisconsin's Strategy for Reducing Global Warming*. July 2008. (http://dnr.wi.gov/environmentprotect/gtfgw/documents/Final_Report.pdf) Appendix E: Task Force Recommended Policies. Biomass and Biofuel, p. 155.
[56] IEA Bioenergy. 2009. *Bioenergy – a Sustainable and Reliable Energy Source*. Energy Research Centre of the Netherlands, E4Tech, Chalmers University of Technology, and the Copernicus Institute of the University of Utrecht. In. Manomet Center for Conservation Sciences. June, 2010. Biomass Sustainability and Carbon Policy Study. Prepared for the Commonwealth of Massachusetts. Report NCI-2010-03, pp. 11-12.

- The amount of the carbon storage in a site's soils and vegetation that would have to be resequestered;
- The timescale being considered for sequestration.

According to WEPCO, CO_2 emission levels related to the combustion of biomass are expected to drop from current levels at the Domtar mill to a net level of zero with the cogeneration plant because the fuel would change from natural gas and other fuels to woody materials that can be regenerated. WEPCO points to the Technical Advisory Committee of the GWTF, which determined that CO_2 emissions from a biomass plant should be considered to be a net level of zero for purposes of modeling GHG reduction policies.[57] The company indicates that forest regeneration in the biomass source areas, or somewhere, should eventually sequester the same amount of CO_2 emitted by the proposed project. If compared to the timescale required for sequestering the amount of CO_2 that would be released during the combustion of coal or natural gas, this process represents a conceptual "closed loop" life- cycle for the pollutant.

The amount of CO_2 sequestered by the regenerating forest or new plantations would depend on the health of the source forest or plantation areas and the effort made to ensure that the amount sequestered would be equivalent in carbon content to the amount consumed at the plant. When a tree's carbon (or the carbon from a portion of a tree) is released into the atmosphere in a single pulse through combustion, it contributes to atmospheric GHG concentrations (and global climate change potential) much more rapidly than woodland timber rotting slowly over decades.

Several factors could affect the relative levels of CO_2 added to the atmosphere, including the carbon content of the tree material being consumed in contrast to the carbon content of the trees grown for regeneration. If more whole trees were chipped for combustion, for example, the regenerating forest would need to grow to the maturity level of those harvested whole trees in order for the system to approach a carbon neutral state. If the biomass burned at the Domtar cogeneration plant were entirely harvest residues, the regenerating forest could sequester that much carbon in less time than it would take to grow the whole tree. Regeneration of the woodlands harvested as whole trees for other industries, like wood products or paper-making industries, would represent a different CO_2 sequestration life cycle.[58]

When the entire carbon cycle is examined, additional CO_2 emissions during harvest, transport, and handling are considered. There also would be some CO_2 production from machinery operation related to the boiler and fuel handling. Research identified so far indicates that precise estimates of CO_2 emission can be made but the accuracy of estimates suffers from the uncertainties related to the type and care of the different pieces of equipment used, the types of landscapes harvested, and the distance from each biomass source to the power plant.

The CO_2 emissions related to hauling the biomass to the plant can be estimated. The U.S. Department of Energy's Energy Information Administration estimate of CO_2 emitted from burning one gallon of diesel fuel is 22.384 pounds per gallon. WEPCO states that there would be 18,000 trucks per year delivering biomass fuel to the south entrance.[59] This would equate to 36,000 trips per year from the wood source to the plant and back to the wood source. Elsewhere in

[57] WEPCO CA application, Technical Support Document, Section 2.18.3, p. 65.
[58] Testimony by Commission staff witness Dennis Koepke discusses this point briefly in rebuttal testimony for the Northern States Power-Wisconsin Bay Front Boiler 5 project (PSC docket 4220-CE-169) and cites the report by the Winrock Foundation for the GWTF that showed that sustainable timber harvest could be net carbon neutral. PSC REF #119012.
[59] Table 2.37-1, p. 81, Technical Support Document, CA application.

its application, WEPCO says that there would be an additional 75 trucks per day that would be primarily biomass fuel delivery, equating to about 19,500 round trips or 39,000 one-way trips per year. Using the 75 trucks-per-day estimate, the CO_2 emissions from trucks delivering biomass to the plant from 75 miles away would be about 6,552 tons of CO_2 per year if those 75 trucks per day delivered fuel on weekdays all year getting about five miles to the gallon and releasing 22.384 pounds of CO_2 per gallon of fuel burned. This figure, 6,552 tons of CO_2 from fuel hauling, is quite small (just over 1.0 percent) compared to the annual CO_{2e} emissions from the CFB. (See Table 5.)

Domtar has indicated that fuel could come from as far away as 100 miles from Rothschild, but is more likely to come from within 75 miles. (See Attachment 6.)[60] If that distance is at the upper economic hauling limit range for biomass fuel (a worst-case scenario), and because more fuel would likely be harvested and delivered from less than that distance, an average hauling distance could be about 37.5 miles. Using the 75 trucks-per-day estimate for trips and the fuel consumption values above, the CO_2 emissions from trucks delivering biomass to the plant from 37.5 miles away would be about 3,276 tons of CO_2 per year. This figure is only about 0.5 percent of the amount of CO_{2e} emissions that would be released from the CFB boiler.

An estimate of CO_2 emitted during harvesting and chipping at the logging site is more difficult to obtain at this point, but it could be in the same range of emission levels. Thus, it appears that while the CO_2 emissions associated with harvesting, hauling, and conveying the biomass to the boiler on the plant site are part of the carbon life cycle emissions of biomass, these values are quite small (less than 3.0 percent) in comparison to the amount of CO_2 emitted during the combustion process. These CO_2 contributions potentially could be less if a portion of the truck fuel used was biodiesel rather than regular diesel fuel.

Burning the biomass in the CFB boiler would create ash as well. WEPCO estimates 1,000 truckloads of ash from the CFB each year. Burning diesel fuel to haul the ash is a necessary activity related to the biomass carbon cycle. If the ash is land spread, it would probably be hauled up to about 40 miles away, to Marathon or one of the surrounding counties. If spreading is not an option, WEPCO intends to truck it to either Pleasant Prairie in Kenosha County or the Elm Road Generating Station south of Milwaukee, approximately 200 miles away. At 1,000 truck loads per year, or 2,000 one-way trips out and back, land spreading the ash would lead to about 179 tons of CO_2 emitted by ash trucks per year if it is spread locally in Marathon County or nearby. If all the ash was trucked to Pleasant Prairie or Elm Road, about 895 tons of CO_2 would be emitted annually. This figure is about 0.1 percent of the CO_{2e} expected to be emitted from the CFB boiler, a relatively small contribution.

The residue from logging that would not be harvested for the cogeneration plant would degrade over time as it decayed on the forest floor, releasing CO_2, and methane, another GHG gradually without the relative bursts of CO_2 emissions from combustion in the boiler.

2.2.1.5 Truck emissions

CO_2 emitted from trucks hauling biomass is discussed in the previous section. However, diesel exhaust includes much more than GHGs.

People living in the project area have expressed concern about air pollutant emissions from trucks at the plant site and along Business USH 51 (Grand Avenue). Truck traffic coming through the

[60] This attachment is adapted from "Map 2," a staff-produced attachment to the Commission's original public notification letter.

south mill entrance would be closest to the neighboring residences immediately south of the mill property and across the street from the entrance. Truck traffic through the north entrance would be closer to other residences and Rothschild Elementary School, where concern has also been expressed about air quality. According to WEPCO, the number of trucks coming through the south entrance per day over a 12-hour period, five days per week, year-round would increase from approximately 35 to 110. Truck traffic through the north entrance would decrease and consequently, so would truck emissions. In the Rothschild area overall, biomass fuel delivery, ash hauling, and delivery of power plant chemicals would contribute to increases in diesel air emissions on the plant site and on Business USH 51 north to the STH 29 interchange and south to the I-39 interchange, a distance of about 1.8 miles. (Potential truck traffic impacts are described further in Section 2.2.4.)

Diesel exhaust is composed of two phases, gas or particle. The gas phase is composed of several urban hazardous air pollutants, such as acetaldehyde, acrolein, benzene, 1,3-butadiene, formaldehyde, and polycyclic aromatic hydrocarbons. The particle phase also has many different types of particles, varying in composition but mostly classified by size. The sizes of diesel particulates of greatest health concern, according to EPA, are fine and ultra-fine particles.[61] The fine and ultra-fine particles might be composed of elemental carbon with adsorbed compounds such as organic compounds, sulfate, nitrate, metals, and other trace elements. There is limited evidence indicating that inhalation of diesel exhaust causes acute and chronic health effects. Acute effects could include irritation to the eyes, nose, throat, and lungs, some neurological effects such as lightheadedness, and a cough or nausea or exacerbation of asthma. Diesel particulate is classified by EPA as a suspected human carcinogen. One could assume that cancer is a non-threshold process where even a very small amount of carcinogen has some level of risk associated with it. Human epidemiological studies have shown an association between diesel exhaust exposure and increased lung cancer rates in occupational settings.

It is not clear how close and how chronic the exposure must be in an occupational setting, but it is likely that the nearby residents and students in Rothschild would not be in an occupational setting relative to the trucks at issue in this case.

WEPCO has provided estimates of the increase in truck tailpipe emissions and resuspended road dust using models provided by DNR and EPA.[62] These do not include GHG emissions. Ultra-low-sulfur diesel fuels to be used by the trucks would make levels of SO_2 emissions from truck traffic negligible. On the project site, trucks would use the southern entrance to the Domtar property off Business USH 51 and follow the path shown in Attachment 2 to and from the biomass fuel unloading station. This is a distance of about 0.57 miles. There would be very little idling because the trucks are expected to be dispatched so there would be very little waiting.[63] However, if trucks did need to wait for some reason, it would decrease diesel combustion emissions if their engines were turned off. WEPCO's truck emission estimates for the plant site are given in Table 8, based on the projected increase of 75 trucks per day. These emissions would be in addition to the existing mill truck emissions and the expected emissions from the cogeneration plant facilities themselves.

[61] "Diesel Particulate Matter." EPA. Air Toxics in New England. http://www.epa.gov/region1/eco/airtox/diesel.html.
[62] WEPCO response to PSC Data Request 01.70. PSC REF #132730.
[63] Personal communication with Dave Derment, WEPCO. October 5, 2010.

Table 8 WEPCO's estimated biomass delivery truck emissions on the cogeneration plant site in tons per year

Pollutant	Annual Emission Rate Increase (tons per year)
NO_x	0.21
VOCs	0.006
CO	0.04
$PM_{2.5}$	0.30

It is probable that more than one truck would be at the weigh scales or dumpers at a time so that some trucks would be waiting and idling instead of moving along the 0.57 miles of roadway. According to EPA, about one gallon of diesel is burned per hour during idling.[64] While the emissions resulting from following the path from the entrance to the unloading area maybe be relatively low, it may still be appropriate to limit the amount of truck engine idling at the Rothschild plant as deliveries wait to be unloaded. This could be done by having a truck idle no longer than a certain number of minutes before the engine must be turned off. Or, it could be done by limiting the numbers of trucks, through scheduling and dispatching, that could be on the property waiting to unload. EPA indicates that, to minimize risk, it would be helpful if the trucks were required to avoid unnecessary idling by turning off the engine when the truck is not in motion. Operators could also be encouraged or required by the company to keep their vehicles in proper condition. And, there are pollution control devices that could be retrofit into the muffler areas of diesel engines.[65]

WEPCO states that trucks would be shut down when they are being unloaded. Trucks waiting to unload would queue in the road between the weigh scales and the truck dumpers, immediately south of the boiler building. Empty trucks waiting to weigh out (if there was a wait) would be idling in the same area going in the opposite direction. One could also assume that full trucks waiting to be weighed would idle, while queued before the weigh-in scale, south of the truck dumpers and north of the biomass storage building. WEPCO states that it is likely that the trucks would idle while they wait to be weighed and unloaded, but also that waiting could be minimized by having a plant dispatcher schedule the truck arrivals and entry to the plant. Dispatched entry would reduce and limit the amount of time for trucks to wait and idle. Weighing and unloading locations are illustrated in Attachment 2.

The DNR air pollution control permit that applies to stationary sources like the proposed boiler does not apply to mobile sources like delivery trucks. Emissions from truck traffic are included in the air permit modeling only as part of the background concentrations.[66] It is not likely that projected truck traffic would be included because it would not be measurable until the project was approved and operating. However, it appears that cumulative increase in $PM_{2.5}$ emissions related to the projected amount of truck emissions would be a relatively small when compared to the projected amount of $PM_{2.5}$ emissions from the proposed CFB boiler. Using values supplied by WEPCO in its application or the data request responses, the estimate of 0.30 tons per year of $PM_{2.5}$ emissions from the additional biomass delivery trucks on the power plant site (See Table 8) would be about 1.5 percent of the amount of total PM emissions expected from the proposed CFB boiler and about 0.32 percent of the estimated maximum allowable emissions of $PM_{2.5}$ for the entire proposed project with BACT (See Table 3). Between its stationary and mobile source programs,

[64] http://www.epa.gov/region1/eco/diesel/pdfs/Diesel_truck_bus_CT.pdf.
[65] Roundy's Supermarkets, Inc. has retrofit some of its truck fleet in this way. ("A Retrofit for Roundy's" In *Diesel Progress*, October 2005, pp. 50-51.)
[66] Personal communication with Steven Dunn, DNR Bureau of Air Management. October 6, 2010.

DNR's Air Management staff is not considering those increases large enough to cause the proposed project to exceed NAAQS.

Considering mobile sources, EPA has a "hot spot" analysis model for looking at high-truck-traffic projects. The traffic threshold for needing such an analysis for air pollution impacts is relatively high. The analysis is used mainly for new truck terminals, freeways, and arterials in nonattainment areas. DNR staff indicates that the Rothschild plant would not likely meet the threshold for such an analysis.[67] An example situation that would be covered by this federal law[68] would be a project on a new highway or expressway that serves a significant volume of diesel truck traffic, such as a facility with greater than 125,000 annual average daily traffic (AADT) where eight percent or more of the AADT (at least 10,000 vehicles) is diesel trucks. An example of a recent analysis for an indirect source air permit was done for a Roundy's Supermarkets, Inc. (Roundy's) proposal to build a large distribution center in Waukesha County. The center would have over 200 trucks arriving and leaving the site each day, some remaining on the site for more than an hour, with 40 to 90 trucks idling or running on site in any hour. Rules were established at the facility to limit idling time and to schedule truck arrivals so that no trucks entered the facility more than four hours prior to or one hour after an arranged appointment time.

Because the major increase in truck traffic at the south entrance would be for biomass deliveries, WEPCO provided estimates for biomass truck delivery emissions on Business USH 51 between STH 29 and I-39. The estimates are shown in Table 9.

Table 9 WEPCO's estimated biomass delivery truck emissions on Business USH 51 between STH 29 and I-39 in tons per year

Pollutant	Annual Emission Rate (tons per year)
NO_x	0.96
VOCs	0.03
CO	0.18
$PM_{2.5}$	0.21

Some comparison between the estimated pollutant amounts on Business USH 51 and the existing air pollution situation on that stretch of highway would be useful. Because the triangle of roads formed by I-39, STH 29, and Business USH 51 would likely be the local roads used in biomass delivery, WEPCO used the DNR model and EPA emission factors to estimate current emissions from all traffic on this triangle for comparison. Its summary, showing emissions in pounds per day, is shown in Table 10. Again, GHGs and SO_2 were not included.

Table 10 WEPCO's estimated current vehicle emissions and future biomass fuel delivery truck emissions in pounds per day for the I-39/STH 29/Business USH 51 road triangle

Pollutant	Future biomass fuel delivery truck emissions (lb/day)	Current vehicle traffic emissions (lb/day)	Future fuel delivery emissions as a percent of current traffic emissions
NO_x	19	792	2.4%
VOCs	1	295	0.3%
CO	4	3497	0.1%
$PM_{2.5}$	4	142	2.8%

[67] Personal communication with Michael Friedlander, DNR Bureau of Air Management. June 29, 2010.
[68] CFR § 93.123(b)(1)(i) and (ii).

This information indicates that none of these pollutants, including volatile organics and fine particulates, would increase beyond 3.0 percent over current pollution levels as a result of the increased number of biomass fuel delivery trucks.

2.2.1.6 Other DNR air permit requirements

The Forest County Potawatomi Community (FCPC) has an agreement with DNR including requirements for facilities proposed to be located near the FCPC Clean Air Act Class I area. The proposed Rothschild pollutant emissions area would be located near enough to this Class I area to require additional DNR analysis of Air-Quality Related Values (AQRV's). The specific AQRV's that must not be exceeded, according to DNR,[69] are:

- an ambient mercury concentration of no more than 1.6ng/m3 at the reservation;
- a sulfur (plus 20 percent of nitrogen) deposition rate of less than 5.5 kilograms per hectare per year.

2.2.2 Ash

The woody forest residues expected to make up the bulk of the fuel for the plant are expected to range from <1 percent to 7 percent ash content. With about 500,000 tons of fuel consumed per year, WEPCO expects about 20,000 tons per year of ash. About 1,500 tons of the ash would be bottom ash, and the rest could be categorized as fly ash.

Coal ash contains contaminants such as mercury, other heavy metals, and arsenic. Coal originates as biomass in earlier times, but the toxins as well as the carbon become concentrated over time. Biomass ash would contain much lower quantities of these types of toxins.

The physical and chemical properties of the wood ash would depend on the tree species, condition of the bark, harvest methods and technology, and operation of the CFB boiler.

2.2.2.1 Bottom ash options

According to the project application, the bottom ash would be mainly rocks, dirt, agglomerated bed sand, and other materials too heavy to fluidize in the boiler. On an annual basis, about 1,500 tons of the CFB's ash would be bottom ash, removed from the bottom of the boiler by a water-cooled conveyor. WEPCO states that the bottom ash would either be beneficially reused, mainly as an aggregate replacement in construction, or disposed of in a landfill. Use as an aggregate replacement in construction is a common beneficial reuse for bottom ash.

2.2.2.2 Fly ash option—beneficial use on land

WEPCO estimates that the cropland in Marathon County and eight counties surrounding it could provide the acreage necessary to use the entire annual supply of wood ash from the Rothschild plant. The ash could be used as a liming agent or as fertilizer.

The liming potential of the ash, its calcium carbonate equivalent (CCE), would be the characteristic most likely to affect the ash's desirability for use in the field. Although it varies among different kinds of ash, the CCE of wood ash is generally around half that of limestone. In northern Wisconsin, there are no limestone deposits and farmers often pay high prices for agricultural lime. The soils are naturally acidic and low in potassium, which also limits their usefulness for the

[69] Letter from Steven Dunn, DNR Air Bureau, to Terry Coughlin, WEPCO. June 30, 2010.

legume-based pasture systems important in this state. The small particle size of fly ash could change the soil pH more rapidly than that of common agricultural lime.[70]

Sale of liming materials is regulated by the Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP) under Wis. Stat. § 94.66. To sell or distribute liming material, an entity must obtain an annual license from the DATCP. To obtain the license, the company must provide the location where the liming material is produced, a description of the material, and "any other information that the department requires."[71] The seller or distributor of the liming material (WEPCO, in this case) must furnish its recipient with a statement of the amount of material and its pH neutralizing index, a number computed using percentages of different liming particle sizes and the CCE of the material itself.[72]

The ash could be tested for nutrient content and applied to fields as a fertilizer, but fly ash applied at liming rates likely to adjust soil pH would already supply substantial amounts of several plant nutrients, including potassium, phosphorus, and magnesium. In addition to these macronutrients, wood ash can be a source of micronutrients needed in trace amounts for adequate plant growth. This would make the ash a fertilizing material as well as a liming material. The sale of fertilizer is also regulated by DATCP, under Wis. Stat. § 94.64, but wood ashes are exempt (as are liming materials) under Wis. Stat. § 94.64(1)(e). Ash also is not listed in the "soil or plant additive" section of the statute but, depending on how it was marketed, it could be regulated as a soil and plant additive because it could have "value in promoting or sustaining plant growth; improving crop yield or quality; promoting or sustaining the fertility of the soil; or favorably modifying the structural, physical or biological properties of the soil for agricultural purposes."[73]

Land application of solid industrial wastes requires a permit from DNR under Wis. Admin. Code § NR 518.06, but wood ash from the proposed project, applied to adjust soil pH (as a liming material) or to supply plant nutrients (as a fertilizer), would be exempt from the permitting requirements under Wis. Admin. Code § 518.04(6)(a), with the following conditions:

1. A bulk chemical analysis must be done according to Wis. Admin. Code § 518.04(6)(a)1.
2. The land spreading must be to adjust pH (liming) or add plant nutrients (fertilizing).
3. The spreading rate must be limited to 15 dry tons per acre at one time and 50 dry tons per acre total cumulative application.
4. The ash must not be spread as top dressing in the following places:
   a. Within 100 feet of navigable bodies of water, wetlands, or floodplains;
   b. Within 1,000 feet of public water supply wells or within 200 feet of private water supply wells;
   c. Within 200 feet of residences without the residents' written consent;
   d. Within 25 feet of public roads;
   e. Within 25 feet of intermittent streams, drainage ways, road ditches, surface tile inlets, or other places that concentrate runoff;
   f. On slopes greater than 6.0 percent, greater than 12 percent if the land is in a soil conservation management plan;
   g. On frozen ground.

[70] Kopecky, M.J., N. Larry Meyers, and Wally Wasko. 1995. Using industrial wood ash as a soil amendment. Publication A3635, University of Wisconsin-Extension, Cooperative Extension. (http://learningstore.uwex.edu/assets/pdfs/A3635.pdf).
[71] Wis. Stat. § 94.66(3).
[72] Wis. Stat. § 94.66(6)(a) and (b).
[73] Wis. Stat. § 94.65(1)(f)3.

5. Records must be maintained for five years by the wood ash generator (WEPCO, in this case). The records must include:
   a. Quantities of ash produced;
   b. Name and address of the person to whom the ash was distributed;
   c. Results of the initial bulk analysis and results of other routine testing where applicable.
6. The wood ash generator (WEPCO in this case) must inform those responsible for landspreading of the ash about the requirements in items 3 and 4 above.
7. The ash landspreaders must keep records of the locations and amounts of ash applied.

Because the ash would be a wood-derived product, an application for liming purposes would apparently not exceed regulatory thresholds for heavy metals.[74] The toxins that might be involved would be heavy metals (such as cadmium, chromium, copper, nickel, lead, or zinc). Heavy metal concentrations are typically low and not in a highly extractable or available form for crops.

2.2.2.3 Fly ash option—reburn as power plant fuel

The percentage of carbon remaining in the ash is expected to be about 3.0 to 5.0 percent, a quantity that would still be able to provide some heat value if reburned in the right situation.

If the land-spreading alternatives turn out to be impractical, the company could truck the ash to another power plant to reburn it as fuel. WEPCO has not discussed with WPSC the possibility for ash reburn at the nearby Weston Generating Station,[75] but says that WEPCO is considering trucking the ash to one of its own power plants that have equipment in place to handle it. The two plants available would be the Pleasant Prairie Power Plant in Kenosha County or the Elm Road Generating Station in Oak Creek, Milwaukee County. Ash produced from the reburn at either of those plants would be totally available for beneficial reuse and would not need to be landfilled.

2.2.2.4 Fly ash option--landfill

WEPCO states that, if no other use is possible, the fly ash could be also disposed of in a landfill. If so, the project could add some incremental need for future landfill expansion. The Marathon County Landfill is less than ten miles away and currently accepts ash from the Domtar mill, but its ash landfill is getting full. The Marathon County Solid Waste Department has begun the process of siting a new landfill on its own property. The utility expects that the CFB ash would be accepted at this new landfill if it has characteristics similar to the current Domtar ash.

If the Marathon County landfill is unavailable and landspreading is not an option, the utility would need to seek out another landfill that would accept the wood ash. This other landfill would likely be farther away than the Marathon County landfill site.

2.2.3 Hazardous materials

The proposed plant would involve certain hazardous materials in its construction and operation.

WEPCO's application states that, during construction, potentially hazardous chemicals on the site would be mainly fuel oils, gasoline, oil, grease, propane, and compressed gas cylinders for cutting processes. WEPCO lists aspects of materials management for these items in general and indicates that a hazardous materials safety plan would be developed with training provided to all site

[74] Kopecky, Meyers, and Wasko. 1995. Already cited.
[75] Attachment to David Lee, WEPCO, response to Ben Callan, DNR, June 3, 2010, "Responses to DNR Questions: Rothschild Biomass Cogeneration Facility," No. 3.

personnel. The plan would involve emergency response procedures for dealing with accidental spills or other releases, fire, and emergency medical service response procedures.

According to the project application, some chemicals required for operation of the plant would be characterized as hazardous materials. WEPCO states that most of those chemicals are now used at the Domtar mill, but the mill is far enough away from the proposed biomass plant facility that it would need its own storage and handling systems.

Containment and handling procedures would be outlined in the facility's Spill Prevention, Control, and Countermeasures (SPCC) plan and HAZCOM program, which the utility states would be similar to those for the Domtar mill. Chemicals to be considered are itemized in Table 11.

Table 11 Hazardous chemicals to be expected at the proposed CFB cogeneration facility

Chemical	Purpose	Storage and handling
Sodium hydroxide (15%)	Cooling tower biological control	6,000 gallon bulk tank at the cooling tower
Corrosion inhibitor	Cooling tower biological control	250 gallon chemical tote in cooling tower pump room
Scale inhibitor		
Sodium bromate		
Carbohydrazide	Oxygen scavenging in boiler water	250 gallon tote in boiler building
Sodium phosphates	pH control in boiler water	Dry containers or pre-blended in 250 gallon totes in boiler building
Antiscalant polymer	Reverse osmosis for demineralized water plant	250 gallon tote with spill containment
Sodium hypochlorite		
Citric acid		
Sodium bisulfate		
Sodium hydroxide		
Sulfuric acid	Mixed bed demineralizers	1,200 gallon bulk tank in water treatment regeneration area; spill containment capacity 1.5 times tank volume (1,800 gallons)
Sodium hydroxide		
Aqueous ammonia (19%)	Flue gas SNCR NO_x control	10,000 gallon bulk tank next to boiler building, with spill containment; delivery by self-unloading tanker truck with vapor recovery in diked area sized to contain full volume of the truck
Oil	Hydraulic extended-arm truck dumper system	2,000 gallon tank with spill containment and fire protection equipment
Oil	Steam turbine-generator lubrication	1,350 gallon tank, with spill containment and fire protection
Oil	Steam turbine-generator control oil tank	150 gallon tank, with spill containment and fire protection
Lubricating oils and greases	Associated with large pumps or gear boxes throughout plant	Small volumes, less than 50 gallons in drums, managed in secure areas as part of overall SPCC plan
Cleaners and solvents	Clean-up needs throughout plant	Small volumes stored in appropriately labeled containers
Fuel for vehicles		Already existing mill refueling facilities

Several hazardous materials could be generated by the facility as waste products during plant operation, but the quantities would probably be expected on a routine basis to qualify the plant as a "Very Small Quantity Generator."[76] Such hazardous wastes could include petroleum-based paints, thinners, parts washer solvent, or incompletely used aerosol cans mostly from the maintenance areas. In a more special situation, stainless steel equipment may need to be cleaned with acid before plant startup and perhaps every five years. This cleaning could result in chromium waste that could be hazardous. Hazardous wastes could also include more universal wastes like

[76] Personal communication from Michael Miller, DNR solid and hazardous wastes specialist, through Ben Callan of the DNR Office of Energy. August 6, 2010.

fluorescent lights, high intensity discharge or HID light bulbs, and so forth. Vehicle maintenance could generate waste oil on site, and hydraulic oil wastes could be generated from a variety of plant equipment. Testing labs might generate waste lab reagents.

2.2.4 Local truck and rail traffic

2.2.4.1 Increases in truck traffic

Seventy-five additional semi-trailer trucks per day hauling biomass fuel for the CFB boiler would travel the short stretch of Business USH 51 near the plant, most likely from the STH 29 off-ramp to the north, and enter Domtar's south entrance per day. Currently, about 35 trucks per day use that entrance to haul finished paper and water treatment plant residue. Seventy-five trucks during the 12-hour delivery day would equate to about a six-truck per hour increase in traffic. Because trucks must also leave the plant, a biomass-related semi-truck would either be entering or leaving the plant every 4.8 minutes on average, in addition to the trucks currently using the entrance. Each biomass delivery truck would handle about 28 green tons. At 28 green tons per truck, the 500,000 green tons per year would translate to about 18,000 trucks per year. The truck dumpers would be able to empty five trucks per hour each, accepting a total of about 280 tons of biomass per hour. Also included would be increased numbers of ash-hauling trucks, sand-hauling trucks, and chemical deliveries. Annually, truck entry at the south entrance would increase from 8,900 trucks currently to about 27,200 trucks with an operational biomass plant. The increased truck traffic could result in some additional air emissions impacts, noise and vibration impacts, safety concerns around the plant entrance, and possible visual nuisances.

2.2.4.2 Potential truck air pollutant emissions

Potential air emissions impacts from the increased truck traffic are discussed in Section 2.2.1.5 and part of Section 2.2.1.4. While PM is the most prevalent pollutant of concern, there is also a concern about emissions of air toxics and GHGs. The most effective emissions control, if the plant is approved, would be limitations on truck idling times, requiring diesel oxidation catalysts, or other strategies. The estimated emissions of air toxics amounts are very small compared to the estimated emissions of the same pollutants from the CFB. Air pollutant emissions also appear to increase only 0.1 to 2.8 percent over the emissions from existing traffic on Business USH 51. DNR does have a program for regulating emissions from indirect, mobile sources at large-scale traffic generators such as a Roundy's or Walmart distribution center, which have about 300 trucks per day, or the proposed Milwaukee Zoo interchange on I-94 with its heavy traffic. Such locations can be "PM hot spots" and DNR staff would conduct PM analyses and estimates for such facilities. The increase in trucks expected at the Rothschild plant is not nearly as large and would not meet regulatory thresholds.[77] DNR staff has pointed out that, for traffic emission increases such as those expected at the Domtar mill, the level of increase is likely not enough to warrant the labor- and data-intensive and modeling work required to estimate emissions.

The diagram in Attachment 2 shows the probable path of truck traffic on the site. The company states in its application that there would be space available on-site for staging and traffic control to sequence truck weigh-in, unloading, and weigh-out. While an average of six trucks per hour would enter the plant, the company states that the biomass unloading capacity would be 12 trucks per hour. However, more trucks would be on-site during peak times each day than at other times. These peak times would be between the hours of 6 a.m. and 8 a.m. and between 3 p.m. and 5 p.m. Of 110 trucks expected to use the south entrance each day, nearly 70 of them would enter during

[77] Personal telephone communication with Michael Friedlander, DNR Air Bureau. June 29, 2010.

these hours in the morning, and nearly 80 of them would depart in the afternoon. Trucks would likely be idling on the plant grounds unless idling restrictions were imposed.

2.2.4.3 Potential for traffic control changes at the south entrance

An increase in local truck traffic, particularly around the south entrance to the Domtar property, would also increase the potential danger for motorists, pedestrians, and bicyclists passing the southern entrance to the plant. WEPCO has applied to the DOT to determine the need for a traffic impact analysis that could result in improvements at the south entrance to make truck traffic into and out of the plant more efficient and safe. Improvements could include some combination of: (1) expanded turn lanes, (2) entrance realignment, or (3) widening of internal mill roadways. The company has also applied to DOT for a traffic signal light at the entrance intersection with Business USH 51. After its review of the Road Access Permit application, DOT requested that WEPCO perform an Intersection Control Evaluation (ICE), to determine if a controlled intersection would be needed at the south mill entrance (Weston Ave.). The ICE was submitted to DOT on July 8, 2010, and WEPCO states that it anticipates a decision from the DOT. There is also an active railroad line that crosses that plant entrance and trucks must cross it as well.

2.2.4.4 Truck noise

The numerous trucks would also make noise while driving or idling. A person within 50 feet of running truck engines would experience noise levels of around 84 to 87 dB. Most of the operating truck engines would be greater than 50 feet from the nearest residences, according to the plant layout in Attachment 2, so the perceived sound levels would be somewhat less. The noise levels would be reduced more by a wall that WEPCO proposes to install along the southern property boundaries. (See Attachment 7.)[78] The wall would be 18 feet high and made of precast concrete, specifically to screen noise, visual impacts, and emissions between the plant and the residences nearby across Rothschild Avenue and South Line Road. WEPCO intends to locate the wall on mill property behind the existing landscaping to lessen the visual impact of the wall. Some additional vegetation plantings would be installed on the residential side of the wall as well. The wall was added to the project proposal after the CA application was submitted, in response to local residents' concerns about truck impacts.[79] The company would work with the village on details of the wall construction.

2.2.4.5 Traffic by Rothschild Elementary School

Several local citizens expressed concern about the effects of increased truck traffic on the operations and students of Rothschild Elementary School across Business USH 51 from the north end of the Domtar property. Trucks passing the elementary school would likely be in motion and would not be idling or concentrating diesel exhaust in the area. The percent increase in traffic on USH Business 51 would be low. As of 2007, about 15,000 – 17,000 vehicles traveled that stretch of Business USH 51 each day.[80] The 75 additional trucks for biomass would be less than a one percent increase in the traffic. WEPCO has stated in testimony for this case that there are currently 385 trucks in the area every day.[81] The 75 additional trucks would represent a 20 percent addition in the daily number of trucks on Business USH 51, with some exiting off STH 29 to the north and some exiting from I-39 south of the mill (without passing the school). Given this information, one would expect little additional adverse impact from the extra traffic on the school or students.

[78] CA Application, Appendix H, part 1, "Sound Barrier Wall Partial Site Plan and Elevations." PSC REF #135784.
[79] WEPCO responses to staff Data Requests 3.10 and 3.11, PSC REF #134432 and #134433.
[80] 2008 Wisconsin Highway Traffic Volume Data. Wisconsin Department of Transportation. November 2009, p. 212.
[81] Direct Testimony of Al Mihm on behalf of WEPCO, PSC REF #136187, p. D1.20.

However, the school district has intervened in the docket and may have additional information to offer during the Commission review process.

2.2.4.6 Railway impacts

There are about four to eight trains per day that cross the south entrance of the mill property, passing through the village or perhaps completing a wood delivery at the north end of the property. It is possible that an occasional train in the process of unloading may reach the south entrance and block it for a short period of time. The south entrance rail crossing has a crossing signal and barrier. It is possible that the increased number of trucks delivering fuel and other supplies could lead to increased congestion around the south entrance when a train is crossing. Otherwise, no changes to the existing railway access to the mill would occur as a result of this project and no new impacts would be expected.

2.2.5 Water quantity and quality

2.2.5.1 Consumptive use

The cogeneration plant would produce up to 300,000 pounds per hour of steam. It would replace the existing Domtar boilers and have a similar consumptive water make up requirement for producing the steam to be used in Domtar's papermaking process and not returned as condensate.

After being used for generation and process work in the mill, the steam would have to be cooled to be reused or discharged. Cooling water would be supplied from the existing mill water intake system in the Wisconsin River, and WEPCO states that there would be no need to increase the rate of withdrawal beyond the amount currently authorized by DNR, which is 12 million gallons per day (MGD). Cooling towers would be constructed and operated on the Domtar mill property near the river just north of the boiler building. The towers would evaporate up to 36,300 gallons per hour[82] or 870,000 gallons per day. Typical consumptive water loss at the plant would be approximately 575,000 gallons per day. While there would be an absolute amount of water lost through evaporation, this water loss would be less than the threshold of two MGD in any 30-day period that requires a consumptive use water loss permit from DNR under Wis. Stat. § 281.35(4)(b).

2.2.5.2 Water withdrawal from Wisconsin River

Domtar would provide the raw water for boiling water make up, non-contact cooling water for plant equipment, boiler blow down cooling water, and cooling tower make up. Domtar's existing intake structure on the Wisconsin River is adjacent to its dam, which forms Lake Wausau. There are three pumps located over three separate turbine pits in the hydroelectric generator facility.

In 2009, Domtar had its Wisconsin Pollution Discharge Elimination System (WPDES) permit reissued. This entailed a DNR reevaluation of its intake system. Domtar's maximum water requirement of 12 MGD represented two percent of the river's seven-day low flow with a ten-year recurrence interval (7Q10). DNR found no adverse impacts to the Wisconsin River fishery. DNR concluded overall that Domtar's process and cooling water intakes met the requirements of Wis. Stat. § 283.31(6). Potential changes to the operation of the intake system have been noticed to DNR, which will evaluate them. WEPCO expects the results of the evaluation to stand because the intake structure would not be modified and would qualify as an existing facility under federal law.[83] Because the cogeneration plant would require much less water than Domtar's permitted

[82] WEPCO CA application, Technical Support Document, p. 41, Table 1.16-1.
[83] WEPCO CA application, Technical Support Document, pp. 70-71.

maximum, no impact on flow in the Wisconsin River would be expected from the proposed project.

2.2.5.3 Water discharge

Process wastewater from the plant would be treated in the existing Domtar facility and discharged to the river *via* an existing permitted Domtar discharge outfall. WEPCO expects the maximum discharge to be about 0.547 MGD and the average discharge to be about 0.360 MGD, about five percent of the 6.8 MGD flow processed now for the mill.

Composition of the plant's water discharge would include substances naturally present in the river itself plus additives used for biofouling control, corrosion inhibition, and scale and silt removal. The substances from the river would increase in concentration by a factor of about ten before discharge because the primary discharge would be water from the cooling towers, where water is continuously cycled, evaporated, and concentrated. There would also be concentrated river constituents from the water filtration and treatment operations that prepare the water to be boiled to produce steam for the generator and mill. The discharge chemistry would be covered under the existing Domtar WPDES permit.

2.2.5.4 Storm water management

Storm water impacts on the plant site are to be reduced with a combination of grass swales, catch basin sumps, the wet detention pond, and keeping the wood storage indoors and wood conveyors covered. The swales, sumps, and pond would catch other suspended solids carried by the storm water so that they do not enter the river.

The pond would be about 250 feet long by about 130 feet wide. It would be a "wet bottom" pond with about 11 vertical feet of water storage. Potential locations for the pond are shown in Attachment 3. One location would be just south of the existing Domtar water treatment clarifiers, along River Street near Williams Street. Another would be just southeast of the clarifiers along the river shore, on land that currently does not belong to Domtar and would need to be purchased or otherwise leased. The pond would capture storm water and allow it to exit slowly into a standpipe arrangement so that particles could settle out of the water before discharge.

A Storm Water Management and Erosion Control Plan, which includes descriptions of the pond, has been submitted by WEPCO to DNR for its review and approval.[84]

2.2.5.5 Potable water and sanitary sewer

Potable water for the plant would be provided by the Rothschild Water Utility for drinking water, sanitary, and shower facilities. The plant would be connected by a three-inch pipeline to either an existing four-inch pipeline near the mill's wastewater treatment facility or an existing six-inch main in Rothschild Street. The utility has a capacity of about 3.4 MGD. According to WEPCO, the plant would be expected to use about 450 gallons per day, which would have very little impact on the utility's system.

The village would provide sanitary sewer service as a customer of the Rib Mountain Metropolitan Sewerage District. A new six-inch pipeline would be connected from the plant to the existing eight-inch pipeline in Rothschild Street/South Line Road. It would carry about 450 gallons per

[84] Storm Water Management and Erosion Control Plan: Domtar Biomass Cogeneration Facility. March 2010. AECOM on behalf of WEPCO. Submitted to DNR Green Bay office.

day. The District's sewage treatment plant has a capacity of 4.27 MGD, so there should be no notable impact after the connection is made and functioning.

2.2.5.6 Cooling towers

The cooling towers proposed for the plant would require the evaporative consumption described above in Section 2.2.5.1 and some blowdown discharge to the river. The blowdown discharge would be handled by wastewater handling facilities on the grounds.

The cooling towers might produce some local fogging, icing, or salt deposition. Potential impacts are discussed in the next section.

2.2.6 Potential community impacts

There has been some discussion locally about the potential for community impacts, both positive and negative. The controversy is discussed in Section 5.3 of this EA.

Local village zoning for the project site is I-2, Heavy Industrial. If the high-voltage transmission interconnection is contracted to ATC, the transmission line route that would run across the river and I-39 would be located in the town of Rib Mountain. The length of the ATC line would not likely meet the statutory threshold for a Certificate of Public Convenience and Necessity from the Commission, but the line would need a Conditional Use permit in the town.

Potential impacts on the local community and municipalities are discussed in this section.

2.2.6.1 Local economy

According to the applicant, Domtar's Rothschild pulp and paper mill and the associated Lignotech chemical facility directly employ 460 men and women at family-supporting wages. Roughly 800 external jobs currently rely on the economic impact of the mill.

WEPCO estimates that the plant would generate about 400 new jobs during a two-year construction process that would be managed by Boldt Construction out of Appleton, Wisconsin. After completion, the plant would require about 150 permanent logging and trucking jobs in the surrounding area to supply the fuel supporting its operation. These logging and trucking jobs may or may not be new jobs, but there is no reason to believe that plant operation would result in a job loss in these occupations as a result of the project operation. On the other hand, there may not be any significant increase in permanent jobs in the Wausau area after the plant was placed in operation.

The proposed project is also expected by WEPCO and Domtar to help make the mill in Rothschild more competitive by reducing production costs associated with the existing boilers and fuels. The new plant would need about the same staffing level for its operation and maintenance, so no significant employment changes at the mill site would be expected after the existing boilers were retired. If the new plant helps the mill to be more competitive without the expense of jobs or supporting businesses, the community should benefit from the economic stability that would result.

According to the executive director of the Great Lakes Timber Professionals Association, the additional woody biomass that Domtar would purchase for the proposed project would make a large, positive difference in the state logging industry, including harvesters, chippers, and

transporters.[85] As paper mills shut down and the market for pulpwood shrinks, the market for biomass is apparently looking attractive, depending on forest and job sustainability and the price to be paid for the wood, as long as quality wood continues to be bought by the mills for manufacturing purposes. More logging/chipping business could lead to more business for truck dealers, truck maintenance firms, tire dealers, and suppliers of forestry tools.

2.2.6.2 Shared revenue payments

The village and the county would both receive payments under the state shared revenue law. The basic payment is equal to the power plant capacity multiplied by $2,000; this payment is split between the two municipalities. Because the mill property lies within the village of Rothschild, the village would receive two-thirds of the payment, and Marathon County would receive one-third. Also, because the plant qualifies as an alternative energy resource, an additional $1,000 per MW would be paid to each municipality under Wis. Stat. § 79.04(7)(c)1. The project also appears to qualify as a "brownfield" project under Wis. Stat. § 560.13(1)(a), which qualifies it for another $600 per MW to each municipality.[86]

Considering these possible payments, the village would receive about $146,650 annually if the "brownfields" definition applies, and about $116,650 if it does not. Marathon County would receive about $113,300 annually if the definition applies, and about $83,300 if it does not.

2.2.6.3 Municipal services and local government impacts

Potable water and sanitary sewer services would be provided by the same utilities with the same infrastructure that now serves the Domtar mill. The necessary services are well within the capacity of these utilities.

Emergency services such as police, fire, and emergency medical technician services would be provided by the village of Rothschild. The village currently supplies these same services to the mill. According to WEPCO's application, the Rothschild Fire/EMS Department would serve the new plant if it is built, just as it currently serves the mill and the nearby WPSC Weston Generating Station. WEPCO listed some examples of possible response needs that could occur at the site, including fires, boiler implosions or explosions, critical piping failures, and chemical spill and release events. The village would not have to add any new facilities or equipment to serve the new cogeneration plant.

There are two public airports in the vicinity of the village. The Wausau Downtown Airport, a city-owned airport that carried commercial flights until the Central Wisconsin Airport began operations in 1969, is located about four miles north of the project area. The Central Wisconsin Airport is located about eight miles to the south and is jointly owned by Marathon and Portage Counties. Neither of these airports is close enough to the project area to be affected by fogging or icing resulting from power plant cooling tower operation. None of the project's taller facilities would be on the approach paths of either airport. The project area is actually part of a no-fly zone if the approach to an airport is missed because of nearby Mosinee Hill and Rib Mountain.

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[85] Interview with Henry Schienebeck. In Foody, Kathleen and Amy Ryan. July 2010. "Biomass fight a matter of trust: special report: a closer look at the proposed Rothschild biomass plant." Wausau Daily Herald.

[86] Under this statute, "brownfield" sites are defined as "abandoned, idle or underused industrial or commercial facilities or sites, the expansion or redevelopment of which is adversely affected by actual or perceived environmental contamination." WEPCO points out that papermaking and pulping has occurred at the mill as well as a function as a rail yard, all of which could have resulted in contamination from diesel and other spills or releases, and the actual location for the cogeneration plant has been essentially outdoor storage and so should be considered underused.

FAA and DOT both would certify the heights and specific positions of the power plant stacks relative to the airport approaches and will require FAA-approved obstruction lighting. This type of lighting defines the location of the stacks for planes or helicopters, and complements their inclusion and positioning on FAA aviation maps. FAA has given a no-hazard determination for the boiler stacks, but the lighting is required.

2.2.6.4 Vulnerable groups, environmental justice issues

There appears to be no differential effect of the project on different racial groups in the area. About 96 percent of the village population is white, and about 3.0 percent is Asian. Other ethnic groups make up smaller percentages of the total. These percentages are similar in the population residing within a half mile of the mill. Immediate neighbors of the mill appear to be very aware of the proposed project and have been very articulate in voicing their opinions about the project.

On a broader regional scale, the Rothschild community is already home to several industries that emit pollutants and create noise or visual impacts, including the WPSC Weston Generating Station located less than two miles from the mill. The DNR air permit is expected examine the cumulative air impacts. Noise modeling in the CA application should account for cumulative noise impacts.

Within the larger community of Rothschild, vulnerable constituent communities are mainly those individuals that are very young, elderly, or infirm. Depending on their location, daycare facilities, schools, hospitals, and elderly care facilities could have a greater potential to be affected by air emissions, fugitive dust, increased noise, increased traffic hazards, or other factors.

The NAAQS set at EPA are based on health research that takes these groups into account, but other individuals that are more sensitive and vulnerable could exist and it would be important to take them into account also.

WEPCO's application states that no schools, daycare centers, hospitals, or nursing homes are within a half mile of the plant site. However, the D.C. Everest School District has identified Rothschild Elementary School as within one-half mile of the plant site and D.C. Everest Junior High School as within one mile of the site. In addition, it has identified St. Mark's Catholic School, which is located about one-half mile from the plant site. Rothschild Elementary School is located on Grand Avenue (Business USH 51) across from the northern end of the mill property where rail and pulpwood storage facilities are located. The school is on the primary route expected to be used for biomass delivery or ash hauling trucks, and thus it may be subject to more truck traffic with attendant noise and diesel emissions. Wausau Child Care, Inc. has been operating before and after school child care at the elementary school since 1968. All of these institutions have been operating at their current locations while the existing Domtar mill has been in operation. Their main concern is whether there would be a notable increase in air pollution, street traffic, or other hazards. These hazards are discussed elsewhere in this document.

Rothschild and D.C. Everest schools already rank among the schools in the U.S. with the highest air pollution. Saving Our Air Resource (SOAR), the local organization intervening in this docket, provided a link to a 2009 USA Today internet feature that ranks schools nationally according to their pollutant exposure. Schools in the low percentile rankings have worse pollutant exposures. Table 12 shows the rankings and pollutant sources of three public schools in the D.C. Everest School District in Rothschild.

Table 12 Public schools of concern for the proposed WEPCO biomass cogeneration project and USA Today feature rankings

School	USA Today Ranking	Pollutants at Issue	Main Sources of the Pollutants at Issue
Rothschild Elementary[87]	19th percentile (23,156 of 127,809 schools have worse air)	Manganese and manganese compounds (51% of overall toxicity)	Central Fabricators Inc., Schofield; Weston Generating Station, Rothschild
		Chromium and chromium compounds (17% of overall toxicity)	Greenheck Fan Corp., Schofield; Fiskars Brands Inc, west of Wausau
		Formaldehyde (13% of overall toxicity)	Lignotech Usa Inc., Rothschild; Greenheck Fan Corp., Schofield
		Sulfuric acid (8% of overall toxicity)	Weston Generating Station, Rothschild
		Nickel and nickel compounds (2% of overall toxicity)	Greenheck Fan Corp, Schofield
DC Everest Junior High School[88]	9th percentile (10,363 of 127,809 schools have worse air)	Manganese and manganese compounds (71% of overall toxicity)	Central Fabricators Inc., Schofield; Greenheck Fan Corp, Schofield; Weston Generating Station, Rothschild
		Chromium and chromium compounds (17% of overall toxicity)	Greenheck Fan Corp, Schofield; Fiskars Brands Inc, west of Wausau
		Sulfuric acid (3% of overall toxicity)	Weston Generating Station, Rothschild
		Nickel and nickel compounds (3% of overall toxicity)	Greenheck Fan Corp, Schofield
		Formaldehyde (2% of overall toxicity)	Lignotech Usa Inc., Rothschild
DC Everest Senior High School[89]	5th percentile 4,792 of 127,809 schools have worse air	Manganese and manganese compounds 76% of overall toxicity	Central Fabricators Inc., Schofield; Greenheck Fan Corp Fan and Blower Mfg, Schofield; Central Fabricators Inc. Schofield, Wisconsin Greenheck Fan Corp Sheet Metal Work, Schofield; Weston Generating Station, Rothschild
		Chromium and chromium compounds 17% of overall toxicity	Greenheck Fan Corp Fan and Blower Mfg, Schofield Greenheck Fan Corp Sheet Metal Work, Schofield Fiskars Brands Inc, west of Wausau
		Nickel and nickel compounds 3% of overall toxicity	Greenheck Fan Corp Fan and Blower Mfg, Schofield
		Sulfuric acid 1% of overall toxicity	Weston Generating Station, Rothschild

One citizen comment on the PSC website states that there is a daycare facility "200 to 300 yards away."[90] It is unknown if this is a reference to the daycare at the elementary school or a different private business.

The District, citing its duty to protect the health and safety of its pupils, employees, and visitors, has intervened in this docket. The District's school buildings, including Rothschild Elementary and D.C. Everest Junior High School, do not have equipment that could remove

[87] USA Today Special Report. "The Smokestack Effect: Toxic Air and America's Schools." http://content.usatoday.com/news/nation/environment/smokestack/school/99518.
[88] USA Today Special Report. "The Smokestack Effect: Toxic Air and America's Schools." http://content.usatoday.com/news/nation/environment/smokestack/school/99514.
[89] USA Today Special Report. "The Smokestack Effect: Toxic Air and America's Schools." http://content.usatoday.com/news/nation/environment/smokestack/school/99513.
[90] PSC REF #131540.

industrially-generated air emissions from the school buildings. The oldest district school buildings lack duct work to which air cleaning equipment could be attached.[91] These schools would thus be vulnerable to local air pollution and noise concerns if they occur.

It could be noted that Domtar is not currently among the main contributors of the primary pollutants identified, but its companion company, Lignotech, is the main contributor of formaldehyde emissions identified at the elementary school and junior high school, which are closer to the Domtar mill than the high school.

2.2.6.5 Views, aesthetics, and lighting

The buildings and conveyors of the cogeneration plant would be mostly new features on the landscape as seen from the village or from across the Wisconsin River. Visual impacts would result from construction of the 265-foot CFB boiler exhaust stack, 200-foot CFB boiler building, 220-foot auxiliary boiler stack, enclosed fuel conveyors that would carry the biomass 135 feet up to the fuel silos. Lower to the ground but closer to nearby residents, a 60-foot tall biomass fuel storage building would be constructed across the fence from South Line Road with a dust vent that would reach to about 110 feet. An 18-foot high concrete wall would be built inside the mill's property line along two sides to block views, truck lights, and noise from the plant for its immediate neighbors. All of these features except the wall are illustrated in the diagram in Attachment 8.[92] Some neighbors in the village have expressed concerns about losing their views of Mosinee Hill and Rib Mountain State Park as well as the Wisconsin River. Simulated views supplied by the applicant in its application materials appear to confirm that these views would be lost or altered. Zoning variances to allow facilities of greater height than allowed by ordinance have been received.[93]

The proposed wall is illustrated in Attachment 7. A number of trees that currently line Rothschild Street and South Line Road would partially hide the wall, which would have a pattern built into it to make it less obtrusive or more interesting. The wall design and patterns proposed by WEPCO and Domtar are being reviewed by the village.[94] Additional woody landscaping along the wall was also proposed in the submittal to the village and would be examined as part of the village approval process. There has been concern expressed by members of the public that the wall is an incomplete or inappropriate response to local worries about truck noise and diesel fumes.

A storm water detention pond would be installed at the south end of the site across the property line from River Road and the properties on South Line Road. The pond would be below grade. Some concerns have been expressed about potential smell or mosquitoes; these concerns would be addressed if they arise.

Rothschild zoning law (Section 3.02 under "Environmental Performance") says that no activity may emit glare or heat that is visible or measurable outside its premises. Exposed sources of light must be shielded so the light is not visible outside of the District. Parking lighting must be downward-directed so it does not extend beyond the property lines (Section 4.11).

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[91] Affidavit of DC Everest Area School District Superintendent Dr. Kristine A. Gilmore in support of the district's petition to intervene in the docket. PSC REF #132814.
[92] CA Application, Appendix H, Part 1, "Partial Site Elevations." PSC REF #135784
[93] PSC REF #135784 through #135786, and #137606
[94] PSC REF #134127 and #134130. WEPCO and Domtar Project Site Plan Application and Submittal Requirements.

WEPCO states that, if the project were approved, external lighting during operation would be downward-directed to reduce off-site visual impacts. The stack would require obstruction lighting to comply with the FAA no-hazard determinations, but this would not contribute glare. Indoor lights might be visible in certain situations through windows or open doors.

2.2.6.6 Fogging, icing, and salting potential from cooling towers

WEPCO modeled potential fogging and icing resulting from cooling tower vapor plumes with the Seasonal and Annual Cooling Tower Impacts (SACTI) model developed by the Electric Power Research Institute (EPRI). The model also makes use of surface meteorological data, which was obtained from the Wausau Downtown Airport National Weather Service collection.[95] Fogging would occur when the condensed water vapor plume from the cooling towers came in contact with the ground, usually during periods of relatively high wind speeds and high relative humidity. Icing would occur if this touch-down occurred during subfreezing weather conditions.

WEPCO is proposing a plume-abatement design cooling tower in the biomass cogeneration plant, although both plume-abatement and standard cooling tower designs were both modeled. This type of cooling tower is designed to keep a larger percentage of the emitted water vapor in the vapor stage so that a visible plume forms less often. The SACTI model, created mainly to model standard cooling towers, overestimates the time and extent of visible plume formation in the plume-abatement design. It also does not indicate the density of the plume, which, according to the model, would be wispier with the plume-abatement tower.

The SACTI model for a plume-abatement system in this case predicts a plume to be visible over the center of Rothschild and over the Wisconsin River up to 50 to 100 hours total in a year, depending on the geographical distance from the towers.

Ground level fogging would occur much less often according to the same model. Surface fogging on the river would be expected to occur about two hours total over a year adjacent to the cooling tower location (see Attachment 2). In town, ground fog would be expected to occur up to a total of just over two hours (about 125 minutes) over a year on Business USH 51 and Alexander Avenue but a total of about two minutes over a year at the southern corner of the Domtar property at Business USH 51 near Edgar Avenue. Chances of ground fogging fall to zero beyond 2,000 feet (just over one-third mile) east of the towers. The nearest entrance to the mill off of Business USH 51 is about 600 feet from the towers, so the extent of potential fogging at any time would be less than 1,400 feet east of the south entrance. Based on the model, no ground fogging would be expected north of 1st Street or to the south on Business USH 51.

Ground icing or rime icing would occur about the same amount of total time per year with the plume-abatement towers: about 36 minutes per year at the river, about two hours total per year east of the towers along Alexander Avenue, and about two minutes total per year at the southern corner of the mill property near Business USH 51. Icing would not be expected to occur at all beyond about 1,400 feet (about a quarter of a mile) past the mill property boundary.

Salt deposition would occur when fog droplets from the cooling tower plume touch objects and evaporate leaving dissolved solids behind. Some salt deposition, about 30 to 50 ounces per acre or about one thousandth of an ounce per square foot over a month's time, could occur along Business USH 51 near the southern portion of the mill property and in the village in the first blocks between

[95] Letter from Brian Stormwind, AECOM, to Terry Coughlin, WEPCO. February 22, 2010. "Subject: Cooling Tower Analysis – Domtar Biomass Project, Rothschild, WI." In Appendix V of the CA application.

Alexander Avenue and Edgar Avenue. The salts likely would be predominantly calcium carbonate.

2.2.6.7 Noise

A noise study was prepared according to the PSC Noise Protocol for power plant applications. In consultation with staff, five noise measuring locations were selected by WEPCO's consultant that appeared to be representative of the different environments around the project area. The potential receptor locations selected by the consultant and PSC staff were all in or near residential areas in the village and across the river. Monitoring results were consistent with expected ambient sound levels for residential areas near industrial facilities.[96]

As discussed under construction impacts in Section 2.1.3, Rothschild village zoning ordinances include a limit for sound emissions for all zones that are not I-2, Heavy Industrial. Although the project site is zoned I-2, WEPCO has stated its intention to meet the limit in the village zoning ordinance.[97] In designing the project, the company intends to keep sound levels from exceeding 85 dBA at the mill property boundary.[98] This sound level, equivalent to the sound level from a bulldozer or grader operating about 50 feet away, is still noticeable. The proposed sound barrier wall would help reduce sound levels in some locations. The noise ordinance also states that "all noise shall be muffled or otherwise controlled so as not to become objectionable due to intermittence, duration, beat frequency, impulse character, or shrillness."

The consultant could not produce a predictive model of what the noise would be from the proposed plant because there is not enough information in the literature about how much noise parts of such a plant would make when it operates. The consultant was able to develop baseline information so that noise level design goals could be set for each of the five noise measuring locations. An increase of 3 dB is usually considered a barely noticeable increase in sound if its character is similar to the sound that existed before the change. Design goals have been set that would limit noise increases at the five locations to between 0.5 and 2.8 dBA. These increases would be generally not noticeable or at least would not interfere with normal activities at each of the five locations. According to the consultant, "Subjectively, noise emissions from the planned facility would be essentially inaudible during louder daytime hours and barely or faintly perceptible during nighttime conditions and only during calm and still wind conditions."[99] For low frequency noise and vibration, the consultant recommends a C-weighted design goal for each noise measuring location to be set at a 70 dBC, with 65 dBC preferred. This is a goal in the range that has been used for other power plant projects.

In response to concerns from residents about potential noise not only from the plant, but from the trucks that serve it, the applicant has proposed a 20-foot wall along Rothschild Avenue and South Line Road to block noise, views, and truck fumes. The wall would be directly across from the residences it is designed to protect and could itself result in some adverse impacts. Residents are requesting that WEPCO or Domtar buy the homes in this location.

Steam releases or "blows" would periodically occur, particularly during plant start-up. These releases would be loud. The consultant recommends that steam safety valves include low pressure

[96] Hessler Associates, Inc. *Environmental Noise Assessment: WE Energies/Domtar Mill Bio-Mass Cogeneration Project, Rothschild, Wisconsin*. January 2010. Appendix L of the CA application.
[97] Village of Rothschild Zoning Ordinance, Section 3.00, "Environmental Performance," Section 3.04, "Noise."
[98] A-weighted decibels are discussed in a footnote to Section 2.1.3.1 of this EA.
[99] Hessler Associates report, p. 3.

drop fiber free vent silencers that reduce sound by at least 20 dBA. For transient releases, it recommends silencers designed to achieve the operational design goals plus 7 dBA. It also recommends that the operator notify the village when such releases are expected to occur so that public announcements can be made. WEPCO states in its application that notifications would be made.

2.2.6.8 Recreation

Recreation impacts from the proposed project, if they occur, would be on the Wisconsin River or on nearby sidewalks across USH Business 51 or along bicycling/walking paths adjacent to the mill or plant. Potential impacts on riverway, sidewalk, or path activities could include visibility decreases due to fogging from the cooling towers or an increase in interfering noise near the plant. Along USH Business 51, an increase in truck traffic at the south entrance to the plant across from Weston Avenue could represent increased hazards for pedestrians and bicyclists. Installation of a traffic safety light could alleviate these hazards.

An electric transmission interconnection to ATC's system would result in a new corridor cut through the woodlands on the west side of the river. The cleared transmission line ROW would separate the southern tip of the existing woodlands from the main forested tract and shrink the size of the upstream forest. The new transmission line and structures would be adjacent to the portion of the bike/walk path crossing the river but would be at least partially screened from path users on the west side of the river. The WPSC 46 kV interconnection option would not affect the river since it would connect with a smaller, already existing line on the street side of the mill property.

Potential impacts to recreational uses on public forest lands could also be a concern where the logging residues and other wood sources are collected for biomass fuel. Removal of dead or undesirable trees from the forest would remove potential wildlife habitat, including some habitat for game species, as well as microhabitats where forest users observe fungi or wildflowers.

2.2.6.9 Property values

Several local citizens have expressed strong concerns about potential effects of the project on their property values. This is especially true of residents at the south end of the mill property. As mentioned above, it has been suggested that WEPCO or Domtar buy four homes on Rothschild Street or compensate the owners.[100]

Overall, property value fluctuations are caused by a complex web of desirable and undesirable aspects, including facilities, services, and impacts that vary significantly from location to location. Without conducting detailed, long-term studies, it is not possible to predict or assess potential impact on property values. To date no studies have shown a clear correlation between power plant location and reduced property values, much less a cause-and-effect relationship that can aid in the prediction of impact. Many factors involve individual value systems and shifting cost and benefits considerations.[101]

Several citizens have commented that the mill has been at its location much longer than any of the current village residents who have moved into homes close to it; however, others indicate that

[100] PSC REF #133199, #132250, #131793, and others.
[101] Reviews of the studies can be found in the WPSC Weston Unit 4 Power Plant, PSC docket 6690-CE-187, July 2004, pp. 228-230, and for the WP&L 300 MW Power Plant, PSC docket 6680-CE-170, July 2008, pp. 254-256.

while the mill's impacts from continued operation are acceptable, the potential impacts of the proposed project are not.

2.3 Potential Impacts of Acquiring Biomass

The primary source of biomass for this project would be forest logging residues. WEPCO states that harvesting biomass residues from forests could provide energy while promoting growth of higher value trees and forest products, reducing forest fire risk, reducing the presence of some weedy tree species, and supporting local communities economically.

Conversely, it appears that there are concerns about the potential for adverse impacts on forest biodiversity and regeneration, forest soil productivity, wildlife habitat, water quality, recreation,[102] and sequestration of carbon to reduce the potential for global climate change. Several of the impacts related to acquisition of the biomass fuel such as removing the biomass, operating harvest equipment in the woods, and transporting fuel from the source to the cogeneration plant would likely have effects similar to timber and pulp wood harvesting that currently happens in the local woodlands, but these impacts would be amplified by the additional volume of wood harvested.

The main concerns about biomass acquisition relate to:

- whether the harvest activities and the types and amounts of residue left behind in the woodland are appropriate to sustain forest soil productivity, water quality, wildlife habitat, and biodiversity;
- whether the amount of residue in the woodland timber harvests is adequate to supply the fuel needs for the proposed plant without adverse effects on already-existing biomass uses and industries;
- whether the harvested areas would adversely affect regional ecological function and diversity;
- whether the biomass harvest, use, and regeneration can be a closed loop so that no additional GHGs accumulate in the atmosphere as a result of the biomass harvest and plant's operation.

About 70 to 75 percent of Domtar-bound harvests are currently monitored by programs implemented on state and county forest lands, federal forest lands, tribal forest lands, and private lands enrolled in the state Managed Forest Lands program. Harvest-derived woody biomass for the proposed biomass-fired plant would be purchased under contract, and WEPCO states that the contract would include a requirement that the Wisconsin Woody Biomass Harvesting Guidelines (Guidelines) be followed along with any applicable Best Management Practices (BMP), Forest Management Guidelines (FMG), and any future modifications to the Guidelines. At this time, Domtar's Rothschild mill is chain-of-custody, third-party certified by the Forest Stewardship Council (FSC) and Sustainable Forestry Initiative (SFI). WEPCO states its intention to work with Domtar to cover land not currently subject to the above guidelines and BMPs so that all "harvest-derived fuels procured for the project" would be subject to the Guidelines, BMPs, and FMGs or to comparable federal requirements.

WEPCO says that loggers likely would retrieve pulpwood and logging residue during the same site visit in order to avoid reworking the site at a later date with equipment for biomass harvesting. If

[102] Wis. Stat. §§ 28.04(2) and 28.11(1), for state and county forests, respectively, both list recreation as a management purpose.

this occurs, then the overall air and noise impacts of the biomass harvest equipment could be somewhat less than for a dedicated biomass harvest visit occurring sometime after a dedicated pulp or lumber harvest visit.

Forest logging is not usually done during wet weather or soft soil conditions because of the increased potential for soil rutting and compaction, and subsequent disruption of drainage. This "down time" occurs during the spring break-up in particular, when many logging operations are shut down because of wet conditions and weight limit restrictions on local roads. Logging is also usually not done when the temperatures are too far below 0°F because the extreme cold temperatures are generally hard on equipment and because there is increased risk of hydraulic hose ruptures that could result in oil leaks onto the ground.

Sustainability is an immediate concern but, attention to sustainability, especially in light of limited research and knowledge available at this time, should probably be thought of as an adaptive process with regular monitoring and recalibration over time. The state's woodlands likely would benefit from an adaptive resource management approach to biomass utilization. To this end, it would be helpful for all companies to track and identify the locations and types of fuels purchased, harvested, and utilized so that researchers can have the necessary data to determine if the harvest methods and intensity are appropriate to maintain and sustain Wisconsin's homegrown biomass fuel supply, and what the ecosystem impacts of different harvest intensities at different scales would be. WEPCO and Domtar have agreed to maintain such records for the proposed project.

2.3.1 Sustainability of forest lands

The concern about sustainability of the forest lands that would be sources of the biomass fuel is that harvest activities in the forests and across landscapes must not damage soil productivity, water quality, wildlife habitat, and biodiversity. In general, sustainability might be judged on timelines that span several generations of tree production and human life.

2.3.1.1 The issue of residue

In addition to operating harvest equipment so as to avoid damage to the woodland site and other resources, there are concerns about the types and amounts of woodland residue left behind after harvest. Concerns about residue types and amounts are currently addressed primarily by the Guidelines developed by the Wisconsin Council on Forestry and DNR. The Guidelines are a beginning point.[103] Following the Guidelines and other FMGs[104] and BMPs[105] would "address potential impacts of increased biomass harvesting on biodiversity conservation, soil nutrient depletion, physical properties of soil, and water quality" according to the Wisconsin Council on Forestry and DNR.[106] In Wisconsin, the Guidelines are few in number and are meant to be implemented in addition to applicable silvicultural guidelines, FMGs, and BMPs. They may at first appear, on the surface, weaker than guidelines or standards in place elsewhere. For instance, it appears that lesser amounts of fine woody debris are recommended to be left behind in Wisconsin

[103] Questions about the adequacy of the Guidelines were raised in the Bay Front case, PSC docket 4220-CE-169, by Clean Wisconsin's expert witness, David Mladenoff, who is to be an expert witness in this docket for SOAR.
[104] Forest Management Guidelines. PUB-FR-226 2003. (http://dnr.wi.gov/forestry/publications/guidelines/toc.htm) and Silviculture and Forest Aesthetics Handbook. PUB #HB2431-5 (http://dnr.wi.gov/forestry/Publications/Handbooks/24315/).
[105] Expected BMPs to be followed would include Wisconsin Forestry Best Management Practices for Water Quality and Wisconsin Forestry Best Management Practices for Invasive Species (http://dnr.wi.gov/forestry/Usesof/bmp/).
[106] Herrick, S.K., J.A. Kovach, E.A. Padley, C.R. Wagner, and D.E. Zastrow. 2009. Wisconsin's Forestland Woody Biomass Harvesting Guidelines. PUB-FR-435-2009. WI DNR Division of Forestry and Wisconsin Council on Forestry; Madison, WI.

than in Michigan, Minnesota, Missouri, or Pennsylvania. However, DNR has indicated that its accounting of fine and coarse woody debris is similar to that of the other states. From other perspectives, it appears that Wisconsin's guidelines are stronger than guidelines and standards in place elsewhere. For instance, site limitations are stricter than in Michigan, Minnesota, Missouri, or Pennsylvania.

The issue of residue is central to the Guidelines. For instance, if too much residue from logging is removed, there would not be enough woody debris to decompose and recondition or refertilize the soil. There also would be fewer microhabitats developing around or under the woody debris, and fewer microhabitats would mean fewer opportunities for regenerative plant species or fungi to germinate and grow to contribute to the woodland's sustainability. If the woodland cannot regenerate appropriately with the remaining logging residue, the acreage of commercially useful or ecologically important woodland in the state will decrease unless artificial planting and other cultural methods are used. In addition, the natural richness of Wisconsin's woodlands will be diminished.

In essence, the Guidelines recommend the following considerations for residue:

1. Retain and limit disturbance to down coarse woody debris (CWD) already present, except on skid trails and landings.
2. Retain and scatter down fine woody debris (FWD) on the site following harvest.
3. Do not remove the forest litter layer, stumps, and/or root systems.

The Guidelines define CWD as "dead woody material found on the forest floor and in waterways that is at least 4 inches in diameter inside the bark at the small end of the piece of wood." For the Guidelines, woody material is fine woody debris (FWD) if "the woody material is less than 4 inches in diameter."[107]

2.3.1.2 Forest Service land

The U.S. Forest Service (USFS) land would be governed by USFS policies as opposed to DNR policies. However, DNR staff has indicated that the National Forests in Wisconsin are using the state Guidelines.

2.3.1.3 Guidelines—biomass removal situations to avoid

The Wisconsin Guidelines manual also includes a reminder about the importance of retaining leave trees, snags, coarse woody debris and slash, conifers, and mast trees for wildlife as part of a sustainable forestry operation. These are also part of the Wisconsin Forest Management Guidelines and Silviculture and Forest Aesthetics Handbook.

The Guidelines also include recommended approaches to more specific, vulnerable situations:

(1) The presence of species of greatest conservation need and sensitive ecosystems (including threatened and endangered species).
(2) Complete salvage operations following severe disturbances (e.g. crown fires).
(3) Shallow soils within 20 inches of bedrock.
(4) Dry, nutrient-poor sandy soils.

[107] Herrick, S.K., J.A. Kovach, E.A. Padley, C.R. Wagner, and D.E. Zastrow. 2009. "Wisconsin's Forestland Woody Biomass Harvesting Guidelines. Field Manual for Loggers, Landowners, and Land Managers." PUB-FR-435-2009. WI DNR Division of Forestry and Wisconsin Council on Forestry; Madison, WI, p. 13.

(5) Wetland soils with at least 16 inches of organic material that are nutrient-poor with a low pH.

2.3.1.4 Guidelines—contract compliance and enforcement

While Wisconsin's Forestland Woody Biomass Harvesting Guidelines and other published woody harvest guidelines are not enforceable by law, WEPCO would serve the sustainability of the woodlands better if it only contracts with those suppliers who agree to be contractually bound to observe them. WEPCO has indicated that it would do that through its agent, Domtar.

WEPCO intends to depend on Domtar's third-party contracting system for biomass supply. The utility has indicated that it would retain the ability in its contracts to utilize only those suppliers that obtain biomass fuel in a sustainable way. The contracts would allow the utility to suspend or cancel the agreement through its agent (Domtar) if the supplier does not adhere to applicable biomass harvesting guidelines or does not comply with applicable managed forest plans or laws of the state where harvesting is occurring. Such a contract could also include specific references to water quality protection, prevention of soil erosion, prevention of disease spread, protection of historic and cultural resources, generally accepted silvicultural practices, and related environmental values. Short of requiring detailed records and affidavits and employing inspectors to verify that sustainable methods particular to each harvest site are used, enforcement of basic sustainability principles through contracts may be the best method for reducing impacts while acquiring biomass from woodland harvest residues.

Taking the contracts a step further, WEPCO and Domtar have worked with DNR staff on auditing/monitoring methods to help with contract enforcement.[108] Their Forestland Woody Biomass Auditing Plan addresses the state woody biomass harvesting guidelines, describes the agreed upon auditing protocol, and provides for supplier training, audit frequencies, delivered material testing frequencies, and reporting.

A detailed auditing plan appears to be necessary only for logging on privately-owned land not enrolled in any state forest programs, since all other lands are subject to forestry certification programs that include requirements for compliance with all forestry BMPs, silvicultural guidelines, and the woody biomass harvesting guidelines.

There is a process in place under state law to require certain harvest records to be kept. Under Wis. Stat. § 26.03(1m), counties have the ability to require notifications of harvest. More precisely,

> "Unless otherwise authorized to do so by the county, no person may harvest any raw forest products, or direct the harvesting of any raw forest products, from any land until 14 days after the clerk of the county in which the land is located is notified of the person's proposal to harvest. The person shall notify the county clerk each year and … the person shall describe the land upon which the harvesting will occur by quarter-quarter section, government lot or fractional lot, unless the county requires a different method for describing the land."

Under Wis. Stat. § 26.36, DNR is required to prepare "a report regarding the extent of forest lands in this state and the potential of such lands to provide fuel for use in electric generating facilities, industrial facilities and home heating systems."

[108] WEPCO response to PSC data request, including submittal of Forestland Woody Biomass Auditing Plan, September 3, 2010. PSC REF #138153.

2.3.1.5 Guidelines—potential evolution and company adaptation

Because the Guidelines are new, it may not be appropriate for the Commission to challenge them or require stricter measures for this project without data or anecdotal information regarding their effectiveness. Alternatively, it may be appropriate to encourage investigations into whether the Guidelines for the harvest of woody residual materials are effective and ecologically sound. DNR states in its Guidelines Field Manual that the Guidelines will be revisited and that it is hoped that new information will allow an evaluation of the sustainability of woody biomass harvests, as well as the efficacy of the Guidelines themselves. At this time, there are not many biomass harvests occurring, and there are gaps in research information about potential impacts. For instance, different forest types and sites around the state would naturally develop different densities and structures of snags and woody debris, and there is too much uncertainty in the current science to provide specific objectives for the amount and type of residue that should be left behind for each forest type. There does not appear to be agreement on simple, efficient methods on how to quantify the amounts of residue: tons per acre, volumes per acre, or numbers of tree parts per acre, for example. Improvement in the Guidelines is expected as research provides new information with which to evaluate them. Such research requires funding and time. If the research shows that the Guidelines could be improved, the state should pursue the improvements.

WEPCO has indicated a willingness to continue to abide by the Guidelines as they evolve if this biomass project is approved.

2.3.2 Adequacy of supply and potential effects on existing industries and uses

2.3.2.1 Concern about potential inadequacy of supply

One example of a biomass-fired power plant that is having trouble with supply is the Kettle Falls generating station in the Selkirk Mountains in the state of Washington.[109] In that case, the plant is having trouble obtaining affordable biomass fuel because of the costs of transporting wood out of the mountains. Whenever the fuel costs hit a certain threshold, the plant goes off line.

The recent Northern States Power Company-Wisconsin Bay Front project review involved considerable discussion about whether the in-woods supply of biomass was adequate enough for Bay Front and the developing Flambeau Paper biofuels plant in Park Falls, Wisconsin, as well as other biomass-fired plants that might be developed in that part of the state. The proposed supply radius of the Rothschild plant overlaps the proposed supply radius area of the approved Bay Front plant, as well as the expected supply radius area of the Flambeau biofuels plant.

Because they would occur on a long-term time frame, biomass harvest opportunities would be an unlikely incentive for woodland owners to avoid converting their forests to other land uses because of the additional income they would receive after logging. On the other hand, additional income from biomass harvest could help logging companies and the forest industry by creating an additional market niche. When a lumber mill or paper mill shuts down, there is less wood residue in the forest because fewer trees are logged, but the biomass industry could provide a market for small and poor quality trees.[110] To utilize harvest residues, a synergistic relationship between lumber or pulp mills and woody residue users must occur.

[109] "Washington biomass plant has trouble finding affordable fuel." Land Letter: The Natural Resources Weekly Report, E & E Publishing Service. May 20, 2010.
[110] Personal communication from Joe Kovach, DNR Forestry. August 18, 2010.

2.3.2.2 Supply studies

To assess the availability of woody residues, WEPCO and Domtar had several studies done independent of each other before WEPCO applied to the PSC for project certification. Five studies were commissioned in all, varying in scope and approach. Three were commissioned by WEPCO to determine what sort of biomass should be the "anchor fuel" for the power plant it would develop, what size plant(s) would be optimal, where the plant might be located, what volume of recoverable logging residues might be available, and what the estimated current or future fuel costs might be.[111] Two studies were commissioned by Domtar to determine if there was sufficient woody biomass in the form of logging residue available to support the prospective 50 MW biomass-fired power plant that would be installed on its property.[112] The two studies, mostly comprised of confidential trade information, concluded that there was sufficient woody biomass available within 75 miles of the mill to support the proposed plant.

2.3.2.3 Adequacy of supply

According to the Renewable Resource Solutions study, about 1.28 million green tons of logging residue biomass are available each year.[113] Forty percent of that would fuel the proposed plant. This percentage can be reduced by accounting for the waste wood materials at the mill that would be burned (approximately 50,000 tons), and possibly further reduced by accounting for the variety of opportunity biomass sources that may be available such as forest industry manufacturing residue, non-logging related tree removal such as municipal tree removals or ROW clearing, clean waste wood from construction sites, or non-timber sale forestry operations like thinning.

According to the application, in December 2009 Domtar and WEPCO hosted a meeting for managers and administrators of public forests and forestry association representatives within the 75-mile procurement radius; attendees were surveyed later. WEPCO says that survey results support the conclusion that there is an adequate fuel supply.

Domtar and WEPCO also point out that, as the demand for paper continues to decrease and the demand for pulpwood follows, there could be an opportunity to utilize "lower quality/smaller diameter wood that traditionally went for pulpwood." This would be wood too small for pulpwood at contemporary prices that could be added to the amount of residue available after logging, unless it qualifies as CWD under the Guidelines.

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[111] Kramer, Joseph M., Sean Weitner, and Andy Mendyk. 2008. *WE Energies Wisconsin Biomass Concentration and Availability Scoping*. Energy Center of Wisconsin, Madison. In Appendix O of WEPCO's CA application. ScottMadden Management Consultants. 2008. *WE Energies Biomass Energy Strategy: Strategy for Siting and Fueling 50 MW of Biomass Generation in Wisconsin*. And SMC. 2009. *WE Energies Biomass Energy Strategy: Cost Comparison for Biomass Generation Options in Wisconsin*. In Appendix O of WEPCO's CA application. Hittle, Thomas J., Forrest M. Gibeault, and Sara S. Eickelberg, 2009. Forest Biomass Resource Analysis: A Review of the Forest Biomass Resource in Northern Wisconsin and Michigan's Upper Peninsula. SLS #2781. Steigerwaldt Land Services, Inc. In Appendix O of WEPCO's CA application.

[112] RMT, Inc. 2009. *Biomass Survey Report to Domtar Paper Company LLC*. In Appendix O of WEPCO's CA application.
Peterson, Donald R. and Heather L. Ross. 2010. *Comprehensive Resource Analysis: Rothschild Biomass Cogeneration Power Facility*. Renewable Resource Solutions, LLC. Crystal Falls, MI. Before submittal, this quantitatively detailed study underwent technical review by Robert Govett of the University of Wisconsin-Stevens Point and Terry Mace of the DNR. Both of these reviewers were technical witnesses for the Wisconsin Paper Council in the Bay Front case (PSC docket 4220-CE-169).

[113] Peterson and Ross. 2010. Comprehensive Resource *Analysis: Rothschild Biomass Cogeneration Power Facility*. Renewable Resource Solutions, LLC. Crystal Falls, MI, p. 6.

Also, conditions could arise when the use of whole trees for fuel is a logical option. One potential example is the removal and replacement of urban ash trees, where the emerald ash borer has invaded, for the purpose of controlling or slowing the spread of the insect. Another potential example is the salvage of trees after a catastrophic event like a tornado that are not merchantable for some other use. (These types of opportunities are listed in Section 1.5.7 of this EA.)

2.3.3 Landscape mosaic

2.3.3.1 Potential impacts

The state's water quality, its wildlife habitat and biodiversity, its nature-based recreation, and the viability of its forestry and agricultural industries, as well as residential life, all require attention to potential impacts of biomass harvesting on the regional landscape mosaic. The composition and structure of the landscape mosaic is an issue that includes biological, agricultural, and social concerns. Landscapes include multiple forest stands as well as the environments present between them.

In Advance Plan 7,[114] DNR and PSC staff recommended that fuels be sought in the following priority order:

a. Wood industry residues;
b. Urban, forest, and agricultural residues (with appropriate residue left in forest or field);
c. Wood or herbaceous energy crops (grown in harmony with sustainable farming practices and the existing local natural landscape); and
d. Harvest of natural woodlands, as a last resort.

These recommendations are still sensible. Forest residues should be used only if the appropriate amounts and type of residue are left behind to sustain the soils and plant communities. If the Guidelines are not strong enough to ensure that this occurs, the Guidelines should be strengthened. If research shows that woodland residue cannot be safely harvested without significant adverse impacts on soil, water, or forest resources, the priority list should be adjusted so that residue ranks below dedicated crops on farmland.

2.3.3.2 Adaptive resource management

The placement and size of residue harvests could have lasting and far-ranging effects on regional ecosystems and landscapes unless integrated with landscape scale biological, agricultural, and social considerations. An adaptive resource management approach could be useful, applied in phases of development that potentially incorporate an increasingly greater biomass harvest. Research proceeding along with the continuing harvest operations could establish regulatory feedback loops for improving harvest methods, harvest intensity, or locations. Compatibility with existing land uses, recreational impacts, and property values is a concern of public and private woodland owners who sell biomass. Studies of how the harvest affects local land uses, ecosystem functions, recreation, or property values could be part of an adaptive approach to biomass fuel supply.

Without these studies and feedback loops, potentially wide-ranging adverse effects of biomass energy use could proliferate without notice until they become great enough to make solutions

[114] PSC docket 5-EP-7.

difficult to find or implement. The end result could be unpredictable large-scale impacts with large ecological, social, or financial costs.

2.3.3.3 Potential impacts on archeological or cultural sites

Many prehistoric sites and historic archeological sites are not yet identified or documented in state inventories, and there are places in Wisconsin's woodlands that are culturally significant among the native peoples because of natural features. Logging and biomass harvest activities could disrupt or damage such sites through machinery impacts on the ground or the removal of trees.

On private lands, there are few legal protections for these resources and, in many situations the effects of logging and biomass harvesting might never be realized. This is the case for many activities on private lands.

However, where federal or state agency interests are involved in biomass harvest, the agencies must comply with Wis. Stat. § 44.40, the state historic preservation law, or Section 106 of the National Historic Preservation Act in notifying the Tribal and State Historic Preservation Officers and in performing required archeological investigations. County forest land represents much of the forest within the 100-mile radius from the proposed plant site. The county forests are also each managed consistent with their respective management plans, which include protection goals for historic, archeological, and other cultural resources. It is important for the agencies to comply with federal and state preservation laws when biomass harvest is occurring under state or federal jurisdiction. The logging or biomass harvest companies must act as the agencies' agents to ensure compliance. Their compliance could be a reminder to private landowners and harvesters who log privately-owned lands of historic importance.

2.3.4 Carbon sequestration

While biomass from well-managed forests can provide energy and help Wisconsin communities, the concept of the well-managed forest must take into account not only the ecological effects of the harvest and regeneration processes but also the value of the forest in the sequestration of carbon. Because of its role in reviewing biomass generation projects, the Commission must consider its social responsibilities for stewardship of Wisconsin forests and also for addressing climate change and the growing need to reduce or mitigate the buildup of CO_2 and other GHGs in the atmosphere.

2.3.4.1 Carbon net emissions considered to be zero—complications

WEPCO requests that the plant's GHG emissions be considered a net zero emission because the wood can be regrown and because national and state public policies on global warming assume that biomass-fired generation has net zero emissions. On its web site, the company states that biomass energy is generally considered carbon neutral because the CO_2 released in biomass combustion for electricity is already part of the existing carbon circulation between the atmosphere and the biosphere from trees and plants. While this is largely true, ecologically, this concept is much more complicated than believed when those policies were formulated, mainly because of time scale considerations, differences in forest productivity, differences in efficiency for different biomass energy sources, and the differences in the types of fuel systems that the biomass energy would replace.[115]

[115] Again, from the IEA Bioenergy Group report. See Section 2.2.1.4 of this EA.

Researchers are interested in clarifying a carbon cycle for biomass energy.[116] To account for the carbon involved in a proposed forest biomass use, the Forest Guild[117] recommends a life cycle analysis that evaluates the effects of forest management and biomass removals on forest carbon. Such an analysis would include:

1. The amount of carbon removed from the site;
2. The amount of carbon used to grow, remove, and transport the material to where it is combusted;
3. The efficiency and carbon emissions of the use of forest biomass for energy, compared to no-biomass-harvest alternative uses;
4. A future carbon sequestration rate for the site;
5. The impact of biomass removals on the site's capacity to grow forest products that store carbon or replace other carbon-intensive products;
6. The time required to resequester the carbon removed from the site as opposed to the time required to resequester the carbon under a no-biomass-harvest scenario;
7. A no-biomass-harvest scenario to show predicted harvest rates for the forest type and site in question and carbon emissions factors for the production, transportation, and use of the wood. This would likely be with use of a fossil fuel.

The first two items are discussed in EA Section 2.2.1.4, and are to some extent site-specific. However, the remaining items are even more site-specific. The analyses would need to be done for different types and sites of forest stands. If enough of the analyses were done, there could eventually be enough information generated to allow comprehensive modeling of carbon flows over time that could provide some ability to predict the global warming impacts of biomass harvests. It is unlikely that this type of research can be done over all types of forests within a short time frame. In the meantime, the Forest Guild offers guidelines to encourage carbon storage while engaged in biomass harvests.

Different places in the state and different forest types have different forest productivities. One could say that woodland productivity is site-specific. Site-specific data was difficult to obtain for the purpose of this EA. The biomass-combustion technology chosen by the utility for this project is a CFB boiler. Commission staff engineers are examining the efficiency and appropriateness of the CFB boiler selection and will provide testimony at the hearing requested by the Commission. The fuel systems that the biomass energy would replace can be looked at in two ways: replacement of the Domtar boilers (a percentage of the energy used) and replacement of other WEPCO generation options at certain times of the day or year. Commission staff is examining potential electric generation dispatch situations as well.

There is also a concern that an increase in the number of biomass-fired energy plants could result in tree material being burned at a faster rate than new tree material can be grown to replace it. If this occurs, a greater amount of carbon would be emitted to the atmosphere over a shorter time than would be resequestered by trees; this could create a long-term net carbon debt instead of a carbon-neutral situation. This hypothetical situation is beyond the scope of the present docket and EA but, if more biomass-fired plants are planned for the future, it might be helpful for a

[116] In the Bay Front case, PSC docket 4220-CE-169, for example, the expert witness for Clean Wisconsin requested that a life cycle analysis be done.
[117] Forest Guild Biomass Working Group. May 2010. Forest Biomass Retention and Harvesting Guidelines for the Northeast, pp. 12-13.

collaboration of state agencies to do an extensive study of statewide or regional biomass availability and procurement impacts.

2.3.4.2 Time scale

In terms of time scale, the net zero emissions scenario might occur as follows. The main fuel is expected to be a portion of the tops and branches of trees that have already been harvested for other purposes, most likely pulpwood or lumber. Tree wood is primarily cellulose, which is a carbon compound. The carbon that would eventually enter the atmosphere as CO_2 is currently stored in the tree wood. If trees are harvested for pulpwood or lumber, the tops and branches are considered residue of the logging process, a waste product of sorts. Using some of that residue to produce energy, while leaving an adequate portion of it behind to maintain ecosystem function, is the situation on which Wisconsin's woody biomass harvest guidelines are based. Looking at the harvest in this light, the only wood being combusted for energy is wood that is already a waste product, or residue, of a logging process conducted for other purposes. To resequester the amount of carbon emitted by biomass generation alone, only the amount of wood that contains a similar amount of carbon would need to be grown, not the amount of wood equivalent to the entire logged tree. The process of biomass residue combustion releases a "pulse" of CO_2 into the atmosphere within a very short time. The amount of carbon from the residue combustion pulse likely would take a few years to resequester in young new trees or young new limbs on existing trees.

Thus, the carbon released into the atmosphere from logging residues combusted in the boiler could not be regenerated in the same time frame as that of the combustion, so a net addition of CO_2 to the atmosphere, a carbon debt, would occur until the regeneration could be effected. The generally accepted theory is that that additional carbon amount would be resequestered in a few years, paying off the carbon debt, by the replanting and regrowth of new trees or additional growth of older trees. A passage of time would be required for a net emission of zero to be reached, but the time might be on the order of several years, rather than decades.

Alternatively, if whole trees were chipped and purchased to burn, the amount of CO_2 emitted during combustion at the cogeneration plant would take much longer, many decades, to be resequestered because that amount of carbon could only be accumulated by mature trees. The time required for a net emission of zero to be reached would be much longer. Or, if one considers the entire logging process, regardless of the end use for the trees themselves, regeneration of the woodlands to provide new timber and pulpwood, as well as the branches and tops that would make up the biomass harvest residue, would take decades or hundreds of years. This would be the situation for some of the opportunity biomass fuels proposed by the utility such as removals of diseased trees from cities or undesirable tree species removed for forest improvement, or from salvaged trees downed after floods or tornados. In these cases, a whole tree's worth of carbon would be released at once and need to be resequestered in a very short time-frame to remain a carbon neutral operation.

2.3.4.3 Possible sources of whole trees

WEPCO and Domtar have indicated that they "do not intend to use whole trees for the power facility" but that there are situations when they might. WEPCO states that whole trees might be used from any of the following situations:[118]

[118] Application Technical Document p. 34, Section 1.14.3

- If an invasive pest species is attacking a certain tree species (like the emerald ash borer) and removal of trees of that species is done to keep the pest's spread under control;
- If a power line, road, or other ROW needs clearing;
- If removal of some undesirable tree species is done to encourage forest regeneration;
- If thinning of stands of high value species is done to remove trees of unmerchantable diameter;
- If salvage is needed after a fire, tornado, or other event;
- If fire hazard reduction requires removal of some trees;
- If trees and other woody vegetation need to be removed from a parcel to reclaim the land for a previous purpose;
- If openings or other removals are needed to create or improve wildlife habitat.

In all of these conditions, the tree harvests would be conducted independent of the need for biomass fuel and the biomass generator would be making use of what otherwise could become waste. However, each of the above scenarios involves using whole trees and would require a much longer time-frame to sequester the same amount of carbon released during combustion.

The situation becomes further complicated if logging companies or paper mills find themselves needing another party to buy residue in order to make the logging/pulping operation profitable during times of slow paper or lumber demand. While only the residue is burned, it may be the sale of residue that makes the whole tree harvest for paper or lumber economically possible. The release of CO_2 into the atmosphere from paper and wood manufacturing industries would be slower, depending on the wood products produced and the length of time before they are discarded, broken down, and decomposed. Trees utilized in this way, that otherwise would not have been harvested, do not continue accumulating carbon as a mature tree would do. The total carbon loss, for which the biomass harvest was at least partially responsible, would not be as quickly resequestered as the amount in the tops and branches proposed as fuel at Rothschild. The time scale to reach a net emission of zero would be closer to that of chipping and burning whole trees for energy as discussed above.

2.3.4.4 Possible increasing of sequestration in the woodlands

It might be possible to increase the amount of carbon sequestered before beginning operation of a biomass-fired plant so that the carbon debt from combustion can be lessened. During the years before any wood was needed for the plant, Domtar and WEPCO could ensure that the amount of woodland available for logging (and thus biomass harvest), is increased so that the carbon is banked (against the prospective carbon debt) and a build-up of additional sequestered carbon occurs before the combustion process begins.

The Forest Guild has indicated that some forest management strategies can apparently increase carbon sequestration rates and store more carbon over time than others.[119] These strategies include cultural methods that increase forest structural complexity, such as uneven-aged management, retaining residual components of the original stand, or extending cutting rotation time to allow more carbon to be sequestered. The use of logging residues rather than whole trees is viable because the residue would eventually decay and emit carbon while live trees would continue to sequester it. If whole trees were used, the use of less healthy trees that are likely to die in the near future could allow the healthier trees to continue to sequester carbon.

[119] Forest Guild Biomass Working Group. May 2010. Forest Biomass Retention and Harvesting Guidelines for the Northeast, pp. 12-13.

In the meantime, the Forest Guild offers guidelines to encourage carbon storage while engaged in biomass harvests, to avoid turning forests into net emitters of carbon:

1. Pursue uneven-age management for shade-tolerant and mid-tolerant species;
2. Utilize methods that allow regeneration to get a jump, such as leaving shelterwood and other forest remnant trees to foster quicker forest regeneration;
3. Lengthen harvest cycles to allow trees to grow older and larger;
4. Take advantage of natural mortality while retaining adequate numbers of snags, decaying trees, and downed material;
5. Use biomass harvests to allow healthy trees to grow so they can be used to manufacture products that hold carbon for long periods or replace carbon-intensive products.

These guidelines relate to good silvicultural practice. Some aspects of them are contained in the Wisconsin Guidelines and FMGs and are manifested in the WEPCO/Domtar plan for whole tree utilization.

3. Evaluation of Reasonable Alternatives and Some of their Economic and Environmental Consequences

In its CA application, WEPCO states that the Rothschild biomass project is a form of renewable resource generation that counterbalances the variable nature of wind generation and the fact that wind resources in the state are stronger at night than during the day and stronger in winter than in summer. WEPCO also states that, after commissioning studies of biomass sources and reviewing them, it determined that the biomass it prefers is woody biomass obtained from the residue of logging operations. To make it easier to obtain biomass fuel, WEPCO chose a partner engaged in the wood industry rather than pursuing a greenfield site for a biomass plant. The partner, identified through a request for proposals (RFP) process, is the only feasible partner that met WEPCO's selection criteria.

There are a number of alternatives to WEPCO's approach. For instance, to counterbalance the timing of wind generation availability, the company could choose to build and operate a natural gas-fired plant that could be controlled and dispatched in response to demand. A biomass alternative to woody biomass from forest logging operations could be either herbaceous biomass (such as switchgrass) or woody biomass from dedicated fuel plantations on existing farmland. Instead of partnering with a company that has experience procuring wood and that needs the steam, WEPCO could partner with a company that can use the steam in a cogeneration context but otherwise depends on WEPCO or another entity to broker plantation-raised fuels. With Domtar as its partner, the utility could propose a smaller cogeneration project that produces electricity and process steam but at the scale of the mill's actual steam and electricity needs. Such a plant might produce about 5 MW of electricity instead of 50 MW. Rather than pursuing a 50 MW plant to meet its obligations under the agreement with Clean Wisconsin and Sierra Club, WEPCO could pursue several, smaller-scale biomass projects in different locations that might be more compatible with the local landscape, cogeneration or not, in order to reach the 50 MW capacity total.

The following sections examine the no-action alternative, WEPCO's evaluated alternatives, alternatives proposed by members of the public, and alternatives proposed by staff.

3.1 No-Action Alternative

The no-action alternative might require WEPCO to continue to search for another way to comply with its agreement with Clean Wisconsin and Sierra Club. The company also might need to continue a search for alternative generation sources to comply with its RPS requirement. Because there is an adequate supply of generation to meet current and future electricity needs until the early 2020s, the demand for electricity in WEPCO's service area would still be met.

3.2 Other Alternatives Evaluated by WEPCO

In its CA application, WEPCO outlined other renewable generation options that it had evaluated: wind generation, hydro generation, solar generation, fuel cells, and other types of biomass generation.[120]

- Wind -- The company listed several disadvantages of wind generation and stated that, although wind would remain a major source of renewable generation for it, it wanted also to build a more "diverse portfolio of renewable energy resources so as not to rely too heavily on wind generation."
- Hydro -- Opportunities to purchase additional hydro contracts beyond those the company already owns were seen as limited, and opportunities to construct new hydro generation were seen as even more limited.
- Solar -- WEPCO's Buy-Back Program incorporates customer-located small capacity solar generation into the company's renewable portfolio, but the company stated that the cost of solar generation at this time limited the potential for development of large-scale facilities that could significantly contribute toward the company's meeting its RPS.
- Fuel cells -- WEPCO indicated a belief that fuel cell technology was not technically or economically feasible at this time to help meet the RPS.
- Biomass -- WEPCO purchased power contracts from generators using landfill gas, municipal and agricultural waste, and energy crops and wood waste. While these sources make up about 20 percent of the company's renewable energy portfolio, they are all small sources. Adding more small sources did not appear to raise the percentage of biomass generation to the appropriate level for the company.

On request, the company provided its reasoning about the benefits of resource diversity that would be achieved by the proposed project.[121] Among other things, these benefits include:

1. A reduction of overall price risk because biomass fuel prices are expected to move independently of coal or gas prices;
2. A reduction in potential biomass fuel costs because the proposed plant could take advantage of lower prices by running at high load and avoid higher prices by running at lower load, and because the project would be the first biomass plant in the area;
3. Utility ownership guarantees the Commission's direct oversight of project cost recovery;
4. Dispatchability and flexibility on when the plant would be run;
5. Available peaking power from biomass because the natural gas-fired boiler could produce Domtar's steam over short runs.

[120] WEPCO CA application, Technical Support Document, pp. 17-19.
[121] PSC REF #133660, WEPCO response to staff Data Request 1.24.

3.3 Other Alternatives Proposed by Members of the Public

Several members of the public who submitted comments to the Commission included suggestions for alternatives to the proposed project. The alternatives included both alterations to the proposed project and other different projects. They are listed below.

1. Convert Weston Generating Station Unit 3 or 4 to biomass. This could help WEPCO meet its RPS requirements and increase the hours of operation for Unit 4, which is otherwise underused. There would be no biomass-fired facility at the Domtar property, and the biomass-fired Weston unit would have an existing landscape buffer. Fuel could be delivered more efficiently by rail instead of semi trucks. Steam might be piped to the Domtar mill.[122]

2. Locate a biomass-fired facility as a cogeneration plant at the Wausau Papers Brokaw mill north of Wausau instead of at the Domtar mill. The location is farther from residences and children, and closer to northern wood sources and transportation routes.[123]

3. Allow a 5 MW biomass cogeneration plant at the Domtar property to provide the needed steam for the mill and a corresponding amount of electricity for WEPCO's customers, and add a 45 MW wind farm. This would add 5 MW of biomass to WEPCO's portfolio diversity and 50 MW to its RPS compliance.[124]

4. Replace the proposed plant capacity with solar or wind power, as suggested by several commenters.[125]

5. Locate the plant at the other end of the Domtar property, away from the residences.[126]

6. Instead of building a new wall to shield residents from views and diesel fumes, require WEPCO or Domtar to buy the four homes on Rothschild Street and convert the street into a new entry for the biomass trucks. This could allow a large turnaround for the trucks and reduce congestion that might occur on Business USH 51. With reduced congestion, diesel fumes could disperse more completely.[127]

Alternative 6 is not a generation supply alternative but is an alternative approach to biomass delivery at the proposed project site.

Of the citizen-suggested alternatives, Alternatives 2, 5, and 6 could still allow WEPCO to comply with the agreement with Clean Wisconsin and Sierra Club. Alternative 3 could help WEPCO partially fulfill its agreement objective. All of the alternatives would help WEPCO meet its RPS requirement (whether or not it meets the agreement). Alternative 1 would require contract negotiations with WPSC and an application to the PSC to repower and change fuels for one of the Weston Power Plant units.

[122] PSC REF #132405 and #131624.
[123] PSC REF #132405.
[124] PSC REF #135608.
[125] For example, PSC REF #133199.
[126] E-mail correspondence between Jeffrey Zibton and Kenneth Rineer. February 14, 2010.
[127] Correspondence to the PSC from Alice Grignon. May 3, 2010.

3.4 Other Alternatives Considered by Staff

Several alternative generation strategies are being considered also by Commission staff. Comparisons among potential alternatives are being done using the Electric Generation Expansion Analysis System model (EGEAS), which is commonly used in generation project reviews to examine potential alternatives and their costs. The modeling and comparisons are expected to be finished in time for their results to be discussed at the technical hearing on the project.

Because WEPCO does not presently need the generation capacity and the project is being undertaken to meet WEPCO's agreement with Clean Wisconsin and Sierra Club and the RPS requirements, only certain alternative generation strategies are being compared in staff's modeling work. These include:

- a stand-alone biomass plant without cogeneration;
- the purchase of Renewable Energy Credits or supplies from power purchase agreement (PPA) proposals;
- co-firing biomass in existing units;
- wind power within Wisconsin;
- wind power outside of Wisconsin.

The biomass alternatives have a 50 MW capacity and the wind power and RPS credits or PPAs are for an equivalent amount of MWh/yr.

Only the first of these alternatives would fulfill WEPCO's obligation in its settlement agreement with Clean Wisconsin and Sierra Club. However, WEPCO's obligation in that settlement is to "submit to the PSCW an application, which it believes in good faith to be complete…" (See Section 1.2 of this EA.) It appears that this obligation may already be completed. The other alternatives being examined would compare possibilities for WEPCO to fulfill its RPS requirements independent of the settlement with the two environmental advocacy organizations.

4. List of Contacts and Summary of Comments or Other Information Received from Them

Several people on this list contacted Commission staff with questions and also answered questions from staff about issues in their areas of expertise.

1. Benjamin Callan of DNR Office of Energy – information about permits that would be required for the project and DNR personnel with access to useful information about northern Wisconsin wood resources.
2. Steven Dunn, Michael Friedlander, Larry Bruss, Ed Jepsen of DNR Air Management Bureau – information about potential air pollutant emissions and WEPCO's pending air permit.
3. James Warren, Joseph Kovach, DNR Division of Forestry – information about existing wood resources and uses, questions about timing, transport, and storage of wood fuel.
4. Thomas Lovejoy, Natural Resources Program Manager, Environmental Analysis, West Central Region – assistance with air issues and cooperation with DNR's environmental assessment process.
5. Jeff Plunkett, Domtar Corporation – biomass procurement and auditing and sampling plans.

6. Arlene Paulsen, Neil Torney of the Village of Rothschild – comparing local and state review processes.
7. Christine Gilmore, Superintendent, DC Everest School System – potential impacts on schools in district.
8. Chip H.R. Brown of Wisconsin Historical Society – inventoried historic properties in project area.
9. Neil Childress of ATC – potential structures, routes, and impacts of transmission interconnection if the ATC option is selected by WEPCO.
10. Peter Taglia of Clean Wisconsin – biomass boiler technologies and emissions.

Several local citizens contacted Commission staff with community information as well as questions about the project review. Numerous written comments were received by e-mail, first-class mail, and the PSC website comment tool. There are numerous written comments for and against the project. Comments that offered information to aid in project analysis are included in the table in Appendix A of this EA

5. Wisconsin Environmental Protection Agency Determination

As stated in the introduction to this EA, the decisions for the proposed project constitute a Type II action under Wis. Admin. Code § PSC 4.10(2).

Under Wis. Admin. Code § PSC 4.10(2), Table 2.a, an EA is required for the review of a cogeneration facility to be constructed at the site of an existing electric generation facility. The proposed project is a biomass-fired electricity and steam cogeneration project. A hydroelectric dam and boilers on Domtar's property that currently generate steam and electricity for the mill qualify as an existing generation facility on the site.

Wis. Admin. Code § 4.20(2)(d) identifies ten broad factors that are useful to consider when evaluating whether an EIS is warranted for a given Commission action. The following subsections consider and discuss each of the ten factors with respect to this case.

5.1 Effects on Geographically Important or Scarce Resources, such as Historic or Cultural Resources, Scenic or Recreational Resources, Prime Farmland, Threatened or Endangered Species, and Ecologically Important Areas

The proposed boiler building and stack, among other facilities, are tall enough to require zoning variances. These facilities would block or partially block the view of the Wisconsin River banks and Mosinee Hill for some nearby residents.

The operating plant would produce additional air emissions and potentially have some impacts on local air quality, which is already compromised to some extent by nearby manufacturing and electric generation facilities. These air pollutant emissions are regulated by the DNR and will be addressed in DNR's EA and in the air pollution control permit, if issued.

The acquisition of about 500,000 green tons of biomass per year has the potential for adverse effects on historic or cultural resources, scenic or recreational resources, protected species, or ecologically important areas if it is not conducted in a sustainable manner. WEPCO and Domtar have agreed to maintain detailed biomass procurement records, work only with contractors who

adhere to the state biomass harvesting guidelines, and cooperate fully with DNR in monitoring to ensure that the Guidelines and other forestry best management practices are employed.

Edaphic, hydrologic, and other ecological conditions in the biomass source areas must be monitored to maintain forest sustainability. Some long-term research and ongoing changes in management of fuel procurement could minimize the potential for adverse environmental and social impacts for this project and any future biomass energy projects that are being planned. DNR is expected to provide testimony inr this case about its strategies for identifying harvest sites and monitoring and enforcing the Guidelines and other forest management tools.

In its final decision for the recently approved biomass-fueled generation project at Bay Front in Ashland, the Commission determined that several conditions of construction and operation would substantially mitigate the potential for serious long-term impacts on the forests of northern Wisconsin.[128] These included:

- Compliance with the Wisconsin Forestland Woody Biomass Harvesting Guidelines;
- Tracking sites where woody residues or other tree materials were obtained and providing periodic biomass fuel reports to the PSC and DNR;
- Devoting resources to support research on the efficacy of the Guidelines and research that is likely to produce demonstrable benefits to the Guidelines;
- Limiting locations for plantations to already existing or abandoned farmland or urban land and prohibiting their establishment in existing natural woodlands. (WEPCO has not proposed development of plantations.)

These mitigation measures were meant to alleviate the potential for significant effects on the quality of the human environment. Long-term adaptive research would provide state agencies, local governments and land managers with the information to make good decisions going forward if the demand for woody biomass increases statewide. WEPCO has committed to fulfilling these conditions for the Rothschild project.[129]

5.2 Conflicts with Federal, State, or Local Plans or Policies

It does not appear that the project would conflict with any federal, state, or local plans or policies. The project site is zoned industrial. The mill has long-term plans to stay in operation at its present location.

The USFS and DNR both have biomass harvest guidelines that govern how biomass would be harvested for the project. DNR and WEPCO are working together to determine how compliance with the Guidelines could be guaranteed.[130]

WEPCO and Domtar applied to the village of Rothschild with site plans for the project and a request for a zoning variance to accommodate some building appearance details and the height of some proposed facilities. The height zoning variances were granted, and the appearance details are being examined by the village Planning Commission.

[128] Final Decision. Northern States Power-Wisconsin Request for Approval to Construct a Biomass Gasifier at its Bay Front Generating Facility. PSC docket 4220-CE-169. PSC REF #125087, pp. 22-23.
[129] WEPCO CA application, Technical Support Document, Section 1.14.4
[130] Personal communications with WEPCO and DNR, July 7, 2010.

The D.C. Everest school district intervened in the project review in order to make sure the health and safety interests of its students are protected.

5.3 Significant Controversy Associated with the Proposed Action

Twelve entities have intervened in the Commission's review of the proposed project. These interveners represent both project proponents and opposing interests, as well as some that have not taken a position.

The Commission agreed to provide intervener funding to the Citizens' Utility Board (CUB) and the local citizens group SOAR. The funding for CUB includes money for CUB staff and its legal services to participate in the proceedings. The funding for SOAR includes money for legal services, money for expert witness services of Dr. Phyllis Fox, a biomass combustion expert, and possibly money for expert witness services of Dr. David Mladenoff, a forestry ecology expert.

Over 220 comments were submitted to the PSC about the project by at least 150 individuals between February 2010 and the issuance of the preliminary determination letter. Some of the people commenting multiple times were opponents of the project, and some of their comments included very detailed questions about the project. About one quarter of the comments were in support of the project, and about three-fourths were against it. The *Wausau Daily Herald* ran several articles about the project and several op-ed pieces addressing the project from both positive and the negative viewpoints.

Interest in the project has also been covered by local and state radio and local television.

WEPCO hired a public relations firm from Milwaukee, the Lynne Broydrick Group, to assist it in building support for the project in Rothschild.[131]

There has been strong interest in the determination about whether an environmental impact statement should be prepared. SOAR, the Wisconsin Chapter of the American Lung Association, Clean Wisconsin, Sierra Club, and the D.C. Everest School District filed requests for preparation of an EIS. About 30 local citizens made similar requests.

During the comment period on the preliminary determination, four parties to the case and about 46 individuals submitted comments. Most of the comments from individuals expressed concerns about the project itself and not the preliminary determination.

5.4 Irreversible Environmental Effects

There would be no notable irreversible environmental effects of construction at the plant site, besides the use of building materials and combustion of fuel for the vehicles and machinery to construct the proposed plant facilities. The project design and the industrial nature of the construction site ensure that no terrestrial natural resources would be affected and few or no irreversible adverse effects on aquatic resources would occur.

The acquisition of the biomass fuel, if not done in compliance with the established Biomass Harvesting Guidelines, other forest management guidelines and forestry BMPs and all regulatory permits, could cause irreversible adverse effects on the long-term health of northern forests. Use of unsustainable forest practices could result in the inability to regenerate forested communities or in

[131] http://www.broydrickgroup.com/

long delays in the regeneration process, affecting carbon sequestration rates and numerous ecological relationships, recreational opportunities, land use patterns, and property values.

WEPCO and Domtar have committed to working with federal, state and municipal forestry staff to ensure that sustainable forestry and biomass harvesting practices are used by its contractors on both public and private lands and keeping detailed records to facilitate post-harvest monitoring and research to study the efficacy of the new statewide biomass harvesting guidelines. The company has also indicated that it would adapt its biomass harvesting practices as needed or recommended by DNR forestry staff if changes in the guidelines are made. It is expected that these commitments would avoid the potential for this project to have long-term irreversible adverse effects on Wisconsin forests.

5.5 New Environmental Effects

The main new environmental effects of the proposed project would be the physical presence of the new facilities that would block or partially block the view of distant landscape features for some nearby residents, some periods of ground fog or icing on the streets near the mill property, and possibly new traffic patterns or signals around the south entrance to the mill.

Another potential new impact could be the ill will generated between local supporters and opponents of the project. It is hoped that, regardless of the outcome of the project review, this impact would be short-lived.

If the biomass is acquired in a sustainable manner, there would be no identifiable new environmental effects related to acquisition of the biomass fuel. There would likely be a net increase in some air pollutant emissions, including GHGs.

Current research likely has not identified and explained all the possible connections between forest practices, forest stand level impacts, and ecological goals. Our knowledge of forest ecosystems is still limited. Field observation and professional experience may reveal new potential adverse impacts and, hopefully, how to avoid or reduce them. The Wisconsin DNR is committed to research on the efficacy and improvement of various aspects of forest management, including the Guidelines.

5.6 Unavoidable Environmental Effects

Construction and installation of the new proposed biomass plant facilities would result in an unavoidable viewshed impact, for some neighboring village residents. Likewise, there would be additional truck traffic bringing biomass to the plant unless the biomass arrives by rail. The volume of truck traffic is expected to increase by a few percentage points on roadways near the plant.

5.7 Precedent Setting Nature of the Proposed Action

The proposed CFB biomass cogeneration project would not be the first of its kind but, at 50 MW, this would be the largest biomass generation facility in Wisconsin. A number of biomass-fired boilers produce energy for industrial use at mills and paper processing facilities in Wisconsin and other nearby states.

According to WEPCO, if the project is approved, the procurement of biomass will incorporate Domtar's current procurement policies (which include "chain-of-custody" procedures and certification by the FSC and SFI) and the additional requirements of following the biomass

harvesting Guidelines and all other applicable BMPs, Forest Management Guidelines, and any future modifications to the Guidelines. These combined protective measures for harvesting forest biomass would set a new standard for biomass procurement and become a precedent for future biomass projects designed to use forest logging residues.

5.8 Cumulative Effect of the Proposed Action when Combined with Other Actions and the Cumulative Effect of Repeated Actions of the Type Proposed

There would be a cumulative effect on air emissions from the plant as its emissions are added to those of other local industries and the coal-fired units at the Weston Generating Station. The plant would add absolute amounts of criteria pollutants, HAPs, and GHGs to the atmosphere. While the applicant believes that the GHG contribution should be considered to be zero, it would be so only if new or existing forests can sequester carbon at the same rate as it is released during combustion.

There would also be a cumulative impact related to the increased truck traffic through the surrounding neighborhoods along the truck routes and on the proposed plant site. This impact would include additional diesel air pollutant emissions, noise, and possible safety implications near the plant entrance and along nearby roadways, such as Business USH 51. If DOT agrees to have it installed, a new traffic signal on Business USH 51 at the south entrance to the Domtar property could reduce or eliminate safety risks related to heavier truck traffic near the plant entrance. WEPCO has committed to ensure that noise levels at the property boundaries of the plant do not exceed levels specified in the village of Rothschild's noise ordinance and has proposed to build a 20-foot decorative concrete wall inside the plant boundaries along streets closest to residential areas to help muffle noise and reduce the likelihood of diesel emissions (from trucks idling on site) drifting into the nearby neighborhood. If these emissions still prove to be problematic, there are measures or solutions that could be implemented to reduce this impact, such as requiring engines to be shut off after idling for a specified time period or improved scheduling of biomass deliveries to avoid trucks waiting in queue to be weighed and unloaded.

There also would be a cumulative impact related to the acquisition of the fuel supply for the Rothschild plant in addition to the amount of biomass removed from the forests for existing wood-fired boilers in the area and other future manufacturing or generation projects. Additional harvesting of forest residues could increase the cumulative impact of logging and other forest activities by increasing site disturbance, decreasing soil fertility over time, and increasing vehicle emissions as equipment works to glean and transport the additional residues after the logging work is completed.

Two other new, large, biomass-fueled energy facilities could be located in Ashland and Park Falls. These facilities were taken into account in the biomass availability studies for this project, but any additional projects would create additional cumulative impacts. If more biomass projects are proposed or planned, it may be helpful for state agencies to cooperatively look examine the biomass fuel supply options across the state in more detail.

If the demand for woody biomass for energy purposes continues to grow, fuel prices could rise and some industries may be unable to compete for the available fuel. Over the long term, a depletion of forest resources in certain regions could occur if sustainable harvest practices for future projects are not utilized.

5.9 Foreclosure of Future Options

The proposed project would not foreclose future options for electric generation, with the exception that additional renewable generation may be more difficult to certify because WEPCO does not need additional capacity in the near future. It would not foreclose options for Domtar, except that the south end of the mill property could not be used for future expansion or other mill-related purposes.

The forested resources for biomass would be expected, through appropriate contracting with Domtar and WEPCO, to be maintained in a sustainable manner so that they could continue to supply useful product to the utility or other consumers in future years. If however, forest mismanagement or overharvesting of residues based on site conditions occurs and some woodlands are no longer sustainable, they would evolve to another vegetative community, possibly one much less productive with far fewer opportunities for wildlife.

Depending on the rate of growth of the biomass fuel industry, some potential users could have their biomass fuel options foreclosed if studies show there is no longer enough fuel for expansion of woody biomass-fuel industry.

If the GHG emissions are not carbon neutral, the additional GHGs emitted to the atmosphere would contribute to the potential for global climate change, which could in turn foreclose options in many ecological and commercial arenas.

5.10 Direct and Indirect Environmental Effects

There would be both direct and indirect environmental effects from this project. Directly, there would be new features at the plant site, including a number of new buildings, conveyor facilities, and a new inside wall along some boundaries of the mill property. There would be more trucks entering and leaving the plant and increased particulate and CO_2 emissions, at least over the short term. There would also be less woody residue left on the forest floor at harvest sites to decompose and provide soil nutrients and less woody residue for other businesses to purchase and use at their own plants.

Indirectly, emissions of GHGs that are not countered by resequestering carbon in the necessary timeframe would contribute to global climate change and its subsequent environmental ramifications.

The uncertainties and possible adverse impacts related to the harvesting of approximately 400,000 to 500,000 tons of woody residues could hopefully be measured, resolved, reduced or avoided through an adaptive resource management process involving monitoring, research, and regulatory feedback loops to the fuel supply process.

6. Recommendation

This detailed EA informs the Commissioners, the affected public, and other interested persons about the project proposal and all of its potential environmental and social impacts. Through numerous data requests, additional analyses, site visits, and a review of public comments, Commission staff has attempted to provide factual information about the project, the mitigative measures proposed by the applicant and other impact reduction strategies, such as emission control technologies that would be required by other regulatory agencies, if the project is approved or permitted.

This EA concludes that construction and operation of WEPCO's proposed biomass cogeneration facility, while likely to have certain specific local environmental effects and some potential broader environmental implications that the Commission will need to consider, would not result in a significant impact on the human environment if the mitigative measures proposed by WEPCO and contained in the DNR's air permit are implemented.[132] Thus, preparation of an EIS is not warranted. While the basis for this determination is discussed in Section 5 (above), it is further outlined below.

Many of the impacts identified in this EA (*e.g.* air pollutant emissions, noise, and increased truck traffic) are similar to those associated with other industries present in the area and appear to be either permittable or capable of being lessened to a substantial extent through mitigation reduction practices already committed to by the applicant:

a. *Noise* – WEPCO has committed to limiting construction activities to normal daytime working hours (6 a.m. to 7 p.m., although some limited night shift or weekend work could occur) and keeping noise levels at the property boundaries during construction and plant operation at or below the levels specified in the village of Rothschild noise ordinance. A 20-foot concrete wall would be constructed inside the mill property boundary along Rothschild Street and South Line Drive where residential homes are closest for the purpose of reducing noise and truck headlight impacts. Notice would be provided to village officials when steam blows are conducted to maintain proper operation of the system's boilers and stacks.
b. *Increased truck traffic* -- Judging from current and future estimated vehicle emissions between I-39, STH 29 and Business USH 51, the volume of traffic on local roads used to deliver biomass fuel would increase no more than 2 to 3 percent, which is not a substantial amount considering the numerous industrial operations in the surrounding area. At the plant entrance, where many more trucks would be entering and leaving the mill property, WEPCO has committed to working with DOT and village officials to reduce safety risks by redesigning the roadway and driveway as needed and installing a traffic signal if warranted.
c. *Air pollutant emissions* – the emissions of the new power plant are being reviewed by the DNR. The DNR's air permit, if issued, would require pollutant control technologies needed to meet EPA-regulated air quality standards when operating the plant, including BACT for particulates and greenhouse gas emissions, the two pollutants of greatest concern. The expected air pollutant emissions, which are regulated by DNR, require preparation of an EA by that agency, rather than an EIS. Although the diesel emissions of trucks that would be idling on-site would not be regulated by DNR, it is expected that DNR's EA will discuss public concerns about diesel exhaust from increased truck traffic and WEPCO has suggested mitigation strategies, such as scheduling biomass deliveries to avoid long queues of trucks idling on-site.
d. *Aesthetics and property values* - The project site is close to residences and recreation areas, but it is zoned as an industrial site and has been in industrial use for many decades. Few, if any, adverse impacts are expected on rare species or natural communities, wetlands or waterbodies, or historical or archeological resources.
e. *Forest sustainability* - Because of the uncertainties inherent in some aspects of this proposal (such as the precise location of harvest sites, types and amounts of residues available), the efficacy of the newly established biomass harvest Guidelines, and the fact that detailed, long-term monitoring studies would be needed to effectively document if

[132] Council on Environmental Quality, 40CFR Part 1508.

adverse impacts on Wisconsin's forest resources would occur, a conclusion about the likelihood of such impacts cannot be drawn at this time - or in the timeframe needed to prepare an EIS for this docket.

With respect to this project, WEPCO and Domtar have committed to employing all of the biomass harvesting practices and record keeping recommended by DNR's forestry staff to avoid long-term impacts and facilitate future monitoring of harvest sites. It is not possible to know the cumulative effects of biomass harvesting on the forests of central and northern Wisconsin that could occur due to the actions of other non-utility businesses in addition to the harvesting necessary for this co-generation facility. Cooperation with and support for long-term forest sustainability studies are needed to find the answers to these questions and develop solutions. WEPCO has agreed to provide such cooperation and support.

If additional biomass projects are on the horizon, a collaborative investigative docket on the potential impacts of biomass harvest and use across the different regions and environments in Wisconsin, involving the PSC, DNR, DATCP, UW-Madison and other interested parties, could facilitate future Commission decision-making and policies related to biomass energy in Wisconsin.

f. *Greenhouse gas emissions* - The outstanding questions and controversies related to whether biomass generation is a "carbon neutral" technology are not resolvable at this time or in this evaluation. EPA has established a process to consider whether a regulatory exemption or different standards should be applied to bioenergy projects and biogenic sources of GHG emissions. In Wisconsin, however, applicants for such projects currently must comply with the emission control technologies required in their DNR-issued air pollution control permits. For this project, in addition to providing estimates of the GHG stack emissions, an attempt has been made to shed some light on various CO_2 life-cycle components of this specific project, such as the transport of the biomass harvest residues. WEPCO's commitment to document the source, volume and type of biomass materials consumed at the plant could further aid in estimating and expanding our knowledge about CO_2 emissions related to biomass acquisition.

In conclusion, because these potential impacts and major concerns can be substantially addressed through construction and operational mitigation measures and strategies committed to by the applicant or are expected to be regulated according to federally established air quality standards designed to protect public health, no significant impacts on the human environment are expected to occur as result of this project.

Appendix A Summary of Comments Received from the Public during EA Preparation

The list in the table is in reverse order of commenter appearance. Most recently received comments from new commenters are at the top. Those who commented early are listed nearer the bottom. Subsequent comments including new subjects from early commenters were added to the subjects of their earlier comment entries instead of adding new entries for each comment received.

Commenter	Main Subjects Discussed
Jeffrey Dix	Concerns about air pollution and truck traffic; application materials should not be basis of decisions; applicant only in it for the money
Jen Kowalski	Wausau Child Care School Age Program at Rothschild Elementary, no concern to date about unsafe emissions at school (letter to whom it may concern, dated May 7, 2010 and received at PSC July 23, 2010)
Jennifer Tessmer	Concerns about air and soil pollution and whether jobs created would be worth it
Mary Jo and Craig Netzer	Concerns about air pollution and trucks; desire for environmental impact statement
Brooke Frenkel	Concerns about air pollution
John Klosinski	Support of project; against fossil fuels
Charity Shanks	Concerns about air pollution
David and Sue Pilon	Support of project
Darlene Dunn	Concerns about air pollution
John Klosinski	Support of project; local concerns out of proportion
Greg Pieski	Support of project, arguments about comfort with projected emissions
Paul LaVanway	Support of project; president and CEO of Lignotech
Cindy and John Gunnerson	Concerns about air pollution and truck traffic; desire for an environmental impact statement
Fred Heider	Concerns about air pollution and truck traffic; desire for an environmental impact statement
Pat Hoffman	Concerns about air pollution
Greg Taylor	Concerns about air pollution
Hedgehog3398 (no other identity given)	Concerns about being sold out to big business and pressures of big money; concerns about health and safety; relation of potential biomass plant disaster to recent BP oil spill disaster in Gulf of Mexico
Thomas Tyskiewicz	Support of project
Patrick McKeough	Support of project for environmental and conservation of fossil fuel effects
Jeffrey Morzenti	Support of project for the sake of surrounding families and businesses in central Wisconsin area
Kathleen Ruenger	Support of project and reputation of the Rothschild Mill
Mark Martindale	Support of project as clean-burning, renewable source of power
David Tackes	Support of project
Eric Peterson	Support of project and concern about mill survival and jobs
Donald and Carol Wangen	Concerns about air pollution and trucks' impacts on local runners and school children
Gerald Meidl	Concerns about air pollution and trucks; desire for an environmental impact statement
Larry Wiederhoeft	Concerns about air pollution; desire for an environmental impact statement
Thomas Hupy	Concerns about air pollution; desire for an environmental impact statement
Walter Kujawa	Concerns about air pollution
Tracy Springer	Concerns about air pollution
James Esslinger	Support of project; mill used to have twice number of workers and up to 125 trucks per day
William and Linda Seidl	Concerns about fine particulate pollution; desire for an environmental impact statement
Russell Nikolai	Concerns about air pollution and increased traffic; worry about human error causing a breakdown like the recent BP oil spill disaster
Edwin Jablonski	Support of project as long as state emissions requirements are met
Susan Wilde	Concerns about health and property value impacts
Tracy Kohl	Concerns about health risks and potentially having to leave the home

Commenter	Main Subjects Discussed
Paul Schwantes	Concerns about air pollution
Matthew Pavlovich	Concerns about air pollution; against a permanent plant for short term jobs
Grace Aldrich	Concerns about air pollution effects on those already infirm
Kevin Aldrich	Concerns about air pollution, about detention pond and mosquitos and disease, and about project feasibility and taxpayer assistance for it; desire for an environmental impact statement; suggestion to buy four homes on Rothschild Street
Brianna Aldrich	Concerns about air pollution
American Lung Association in Wisconsin	Concerns about air pollution; desire for an environmental impact statement
Kenneth Rajek	Concerns about health risks and truck traffic, taxpayer subsidies for the project
Jim Foss	Concern about air pollution and risk to children
Anne Michelsen	Concerns about air pollution; worry about locating a business in Rothschild area; desire for an environmental impact statement
Gail Koehler	Concerns about air pollution, truck traffic, and local tax burden while electricity sold in Milwaukee
Gail and Dave Cappel	Concerns about air pollution
Scott Miles	Concerns about small site in residential area near elementary school; concern about use of Wisconsin River water; desire for an environmental impact statement
Mark Schuler	Concern about project being near an elementary school; desire for environmental impact statement
Steve Cotton	Concerns about air pollution, children's safety, and property value loss
Mary and Ken Rajek	Concerns about air pollution, truck traffic, noise, and fact that impacts are in Rothschild while electricity sold in Milwaukee
Gary Dettmering	Opposed to the plant in Rothschild
Mary Dettmering	Concerns about air pollution and health
Donna Blankenheim	Concerns about air pollution and health
Sarah Hupy	Concerns about air pollution, truck traffic, and fact that the electricity goes to Milwaukee; desire for clean, nonpolluting green energy; desire for environmental impact statement
Sue Pooch	Concerns about air pollution and desecration of beauty in area
Ursa Swensen	Concern about health and safety impacts; desire for wind or solar energy; desire for environmental impact statement
Marlene Kort	Concern about air pollution; desire for wind power
John Olson	Support of project
Howard Cleveland	Concerns about noise and odor
Orville and Elaine Dabler	Support of project
Ernest Luedke	Concerns about air pollution, proximity to residences, and fact that risks in Rothschild while electricity goes to SE Wisconsin
William Beranek	Concerns about air and river pollution, rate increases, truck traffic, impacts to the local streets, potential taxpayer assistance for the project; impacts to people on the river; desire for clean renewable energy
Mark Folino	Concerns about air pollution and property value impacts
David Tackes	Support of project
Warren Netzow	Support of project; favors shared power in industry
Jodi Devine	Concerns about air pollution; desire for environmental impact statement
Darwin Gregerson	Concerns about air pollution; desire for environmental impact statement
Carla Aldrich	Need for a permanent air monitoring system in the area; concerns about the storm water detention pond, greenhouse gas emissions, noise, public financial assistance for the project, increased rates, dust, and property value decrease; desire for an environmental impact statement
Sindy Graves	Concerns about air pollution and traffic
Rebecca Simms	Citations for information about biomass power and air and transmission impacts; concern about greenhouse gases
Paul Schwantes	Desire for environmental impact statement
Debra Ehlert	Concerns about air and noise pollution, proximity to residences and park, health impacts

Commenter	Main Subjects Discussed
Joseph Twaroski	Support of project for potential proliferation of economic benefits and potential changes in power industry
Allen Johnsen	Concern about the electricity going elsewhere while risks stay in Rothschild; concern about paper mill going out of business and leaving power plant behind
Linda _____	Support of project for job support
Randall Hamann	Support of project and safety and environmental record of mill
Diane and Bruce Stroik	Concerns about air pollution and risks in Rothschild for electricity not needed; characterization of plant as a giant fireplace; desire for environmental impact statement
Debra Weiss	Project not needed; suggestion that Weston 3 or 4 convert to biomass
Linda Gregerson	Concerns about air pollution and health, risks in Rothschild for electricity going elsewhere; suggestion that steam from Weston Generating Station be used at Domtar instead; desire for environmental impact statement
Penny Duchateau	Concerns about air pollution and safety; distrust of the applicant and Domtar; desire for an environmental impact statement
John Marshall	Concerns about air pollution and truck traffic; feeling that the companies have not been truthful; daycare children 200-300 yards away
Jon Thompson	Concerns about health and property value decrease; house up for sale
Lorn Gordon	Concern about pollution; desire for an environmental impact statement
Terry Wiegert	Support of project
M. Jane Olson	Desire for environmental impact statement
Renae Rudeen	Concerns about air pollution and traffic and children's health; desire for environmental impact statement
Cynthia Damrow	Concern for community health and health of Wisconsin River Valley ecosystems
Jim DuChateau	Concerns about air pollution, truck traffic, and property value decrease
Spencer Gaylord	Concerns about air pollution, truck traffic, proximity to residences, and placement of WEPCO facility in WPS territory
Francis Fraundorf	Concern about health impacts; desire for environmental impact statement
David Zibton	Concerns about health and property value impacts
Mark Kopplin	Concern about companies' behavior, why plant here for electricity in SE Wisconsin, and where new jobs would come from
Penny Drumm	Support of project; rumors should stop; Lignotech emits odors, not mill
James Berens	Support of project
Steven Gottschalk	Support of project; description of pollution in 1970s
Brian Dunnum	Support of project; popple wood
Kim Hoffman	Concerns about air pollution, noise, proximity to residences, property value impacts, where new jobs would come from
Brian Smith	Concerns about air pollution, truck traffic, state subsidization of the project
Stacy Tepp	Concerns about air pollution, proximity to residents and parks, visual impacts, water quality, children's health
Shawn Esser	Concerns about air pollution; desire for environmental impact statement
Alice Grignon	Concerns about air pollution and truck traffic; concern that proposed wall is inadequate; suggestion that homes on Rothschild Street be bought and the street be used for truck access to the plant
Jon Schulteis	Concerns about green initiatives that are not needed, costs
Mike Wayerski	Support of project
Jim Bembinster	Support of project, but biomass fuel should come from raw materials that cannot be used in the forest products industry
Bruce Sopkowicz	Support of project; mill has been good neighbor for many years
Joni Filipiak	Support of project; Domtar good forest steward
Carole Zinser	Support of project; burning of downed urban wood included
Sue Decker	Concern about project producing dirty energy, not needed, with no guarantee of new jobs
Thomas Huffine	Biomass uses more energy than it produces because of trucking; nuclear power better
Carolie Fox	Concerns about air pollution, truck traffic, no guarantee of new jobs, health of children and elderly
Theresa Stencil	Concerns about air pollution, truck traffic, noise, damage to scenic resources in neighborhood
Carmie Thompson	Favoring nuclear power or nonrecyclable, burnable trash
Michael Radtke	Support of project

Commenter	Main Subjects Discussed
Jay Bredl	Support of project; construction work
Sue Roeske	Concern about greenhouse gases, truck traffic; desire for environmental impact statement
Corrinne Derleth	Support of project; assumes village supports it; could burn paper waste
John Weber	Support of project; could help woodland management
Wayne Nelson	Support of project if source does not remove wood needed by industry and the public
Mark Mittelsteadt	Concerns about air pollution, misguided state mandate on renewable energy
Robert Hughes	Numerous comments on potential hazards of biomass combustion and this project in particular, including concerns about air emissions such as particulates and greenhouse gases, water consumption and discharge impacts, availability of wood and impacts on biomass supply for other industries, job creation, fire hazard, truck traffic, noise, ash production, lead in building demolition, the proposed concrete sound barrier wall, and other potential impacts of the project; references to learn more about biomass energy concerns; concerns about behavior of the applicant and the mill; concern about Domtar's ability to run the plant; concerns about interpretability of air permit application; desire for an environmental impact statement; need for more information; suggestion to buy four homes on Rothschild Street; alternative project approaches to consider; difference in attitude of Wisconsin Paper Council between Ashland project and this one; feeling that the project is being "rammed through"
John Deppe	Support of project; jobs
Luis Lopes-Serrao	Support of project; renewable energy on existing industrial property
Bryan Kumfer	Support of project
Dale and Charlene Michlig	Concerns about air pollution, truck traffic, impacts on Business USH 51, and proximity to residences
Bonnie, Thomas Sr., Thomas Jr., Amy, and Amy Babl	Concerns about air pollution, odor, traffic, noise, proximity to residences
John Behrens	Concerns about odor and visual impacts along river
Wayne Schmitt	Support of project; efficient and renewable
Thomas Litzer	Concern about air pollution and proximity to residences
Beverly Oleson	Concern about fallout from fuel combustion
Jim and Barb Grezenski	Support of project; will help loggers
Earl Pelot	Support of project
Patricia Check	Support of project; neighbors of mill for years; noise from lawnmowers, barking dogs, loud mufflers, and rail line greater irritants
Stephen and Traci Parrott	Support of project; construction jobs plus maintenance and operation jobs
Milton Hamann	Support of project
Bonnie Laessig	Support of project; paper mill viable part of community
James Drost	Support of project; good for community, with mill as old resident
Christina Winnie	Support of project; starting Facebook page for supporters
Raj Patel	Support of project; good for local business
Tom Bullman	Support of project; good for local business
Billy Kucil	Support of project; jobs
Jeffrey Zibton	Concerns about truck traffic, safety, noise, lighting, potential for dust explosions or accidental biomass fires, lack of alternative sites considered, transmission line impacts, effects on municipal services, children's health, whether new jobs actually occur or old jobs lost, tall facilities' visual impacts, and property value impacts; concern about inadequacy of concrete wall to overcome impacts; desire for homes on Rothschild Street to be bought out; desire for environmental impact statement
Kinghoekstra	Concern about elementary school
William Werba	Support of project
Barbara Baroli	Support of project
Edward Adamski	Support of project
Cara Palmer	Concern about pollution, noise, children's health, traffic, and decline in property values
Kathleen and Alan Tepp	Concerns about air pollution, noise, truck traffic, property value decrease, fact that the energy is not needed; request for compensation for risks to home; information for citizens to contact Sierra Club; desire for environmental impact statement

Commenter	Main Subjects Discussed
Todd and Sara Babl	Concerns about air pollution, proximity of plant to residences and park, odor, noise, truck traffic, children's health impacts, potential for plant to convert to burning tar waste, tires, etc., and risks for Rothschild while electricity meant for elsewhere; information for citizens to contact Ecolaw, Sierra Club; organizing early citizen meetings

Appendix B Summary of Comments Received from the Public during Preliminary Determination Comment Period

A preliminary determination letter was issued on August 26, 2010, followed by a public comment period on the determination that extended to September 16, 2010.

Comments that arrived at the PSC during that time are tabulated and represented below. The list in the table is in alphabetical order by comment signature. The table includes comments sent to the PSC from case interveners as well. All comments are on file at the Commission offices and available in the Commission internet site Electronic Regulatory Filing system.

Most comments from members of the public were focused on the project itself although some did include a request for an EIS. The two most detailed requests for an EIS came from the intervenors CUB and SOAR. The applicant, WEPCO, made the most detailed request not to prepare an EIS.

Commenter	Main Subjects Discussed
Carla Aldrich	Jobs not guaranteed; air pollution a concern, vegetative screen not reliable
Kevin Aldrich	Wasteful spending to create additional excess capacity; potential loss of biomass supply; concern about efficiency of plant
Donald and Barbara Bartz	Support project; have faith in regulatory agencies
Bob Beck	Agency impact analysis adequate
Barbara Berry	No reason not to do an EIS; cannot trust businesses to watch out for good of people and environment
Rose Britz	Support project
Joseph Buska Jr	Concern about truck traffic increase
CUB (Kira E. Loehr)	EA indicates EIS needed, lack of identification of mitigation measures to avoid or minimize impacts; potential impacts include air pollution from plant and trucks, greenhouse gas emissions, landscape changes from biomass harvest, adverse effects on forest sustainability, adverse effects on the village of Rothschild
Allen and Lori Davidowski	Support project
Mary Dettmering	Concern about air pollution; concern about truck increase on lot, running and making noise; concern about home property value
Domtar (Andrew J. Turner)	Agrees with preliminary determination that EIS not needed
Al Drechsler	Support project
Penny A. DuChateau	EIS needed given size, extent, and location of project; deserved by area residents, morally and ethically; would provide absolute assurance that project not harmful; would analyze sustainability of forest resource; concerns about air pollution important; concerns about jobs are idle threat
Richard Giacalone	Support project for job opportunity support
Darwin Gregerson	EIS desperately needed by independent party; air and water quality should not be left to marketing firms and power companies, that limited questions in forums meant to clarify issues
Linda Gregerson	EIS would clarify cumulative impact of PM pollution; jobs not issue; concern about WEPCO marketing methods; EIS needed to show concern for public welfare and assure that community can exist without fear
Alice Grignon	Support project after first expressing concerns; company communication and cooperation appreciated; have learned much
Rodney Gutenberger	Support project; trust agencies to develop necessary safeguards and oversight
Carl Heiss	Concern about impacts of burning wood; concern about increase in logging truck traffic; electricity not needed; mitigation measures analyzed in EA not adequate; PSC a champion of industry it is supposed to regulate; mitigation example: re-open STH 29/Business USH 51 interchange access directly to mill property
Robert Hughes	EIS requested, particularly to clarify air pollution concerns, potential problems from truck traffic, health of local residents and their children, and to put Domtar and WEPCO under the microscope; village has not provided project access for examination; air pollution a concern, particularly for sensitive individuals; property value impact a concern; companies must be ordered to answer questions from citizens
Sarah Hupy	Concerns about air pollution; biomass supply not sustainable
David B. Jaeschke	Support project, good for environment and economy
John Klosinski	EA is adequate for a project of this type
Michele Koth	Concerns about residents' health and about speed of review process

Commenter	Main Subjects Discussed
Michele Lindell	Concerns about residents' health; potential adverse impacts on effort to renovate area and attract young professionals
Charlene Michlig	EA vague but shows several impacts on air, local residents, local traffic, forest sustainability, property values; companies' efforts to minimize impacts to the extent feasible not satisfactory; what makes impacts "significant?"
Mark Mugavero	Request EIS; Rothschild residents' concerns falling on deaf ears; concerns about air pollution, noise, property value impacts; why is project not being put in Brokaw?
Mary Jo Netzer	Request EIS to fully study impacts on village and residents; project will make huge change; concern about property value drop, health care cost increase, need to move schools
Russell and Leila Nikolai	Concerns about lack of access to information early in project development, lack of representation by village during local approval processes, unreasonable promotion of jobs that will not exist, air pollution monitoring, whether PSC staff has made personal tour of the area; project must be stopped now
David Northrup	Support project as a renewable energy source
Jane Olson	Request EIS, inexpensive for scope of project and important study to see if air will be safe
Rusty Olson	Request EIS at least, and no approval of project
Cara Palmer	Request EIS so that responsible decision can be made and public can see what impacts will be; citizens' rights have not mattered; plant not needed
Stephen Parrot	Support project for economic impact and environmental pluses
Sue Roeske	Disappointed that EIS not required; concerns about air pollution, whether installations would be inspected, whether penalties for non-compliance; if burden of air pollution control on DNR, why is PSC involved at all?
Renae Rudeen	Reconsider EIS, to confirm safety of plant and show local children it is good to stand up for what you believe; give residents fair chance; no harm in double-checking risk factors
Bryan Schroder	Support project, for jobs and for alternative fuel source
Paul Schwantes	Reconsider EIS, so people really know how the plant would affect them and to give them confidence that their government, particularly the PSC, cares about residents' concerns and rights; EIS was last hope for opponents of project who have been intimidated by the applicants and local government processes; WEPCO and Lynne Broydrick Group have lied
Reverend Charity Shanks	Concern that vulnerable people will die because of air pollution as a result of PSC and Rothschild refusing to deny the project; concern about loss of forestland, wildlife, water resources, and more because of unsustainable biomass harvests; concern that project would be obsolete soon because of cleaner renewable projects and current excess capacity
SOAR (Dennis Grzezinski)	Object to preliminary determination; EA demonstrates that EIS must be prepared; EA identifies many potential significant impacts of project, including impacts on forest sustainability, greenhouse gas emissions, and property values; EA fails to sufficiently detail how proposed mitigation measures eliminate need for EIS
Theresa Stencil	Concern about increased truck traffic
Gary Stevens	Support project for jobs
Rick Svennes	Request environmental impact analysis that would address macro impact of biomass on existing environment and community
Neal Torney	EA includes social aspects, but want to describe economic development that would occur, including jobs; village plan commission and village board unanimously approved site plan; board of zoning appeals unanimously approved variances
Billy L. Viertel	Agrees with preliminary determination that EIS not needed
John Weiler	Support project, for the community and the earth
WEPCO (Roman Draba)	EIS not needed; environmental review information already in EA; factual corrections suggested; most requests for EIS are about air pollution, outside scope of PSC project review
Village of Weston (Dean Zuleger)	Concern about air pollution into Weston community and resulting health and water quality impacts, including both surface waters and drinking water; Weston could bear burden because of height of stack and effluent inversions resulting from sudden drops in barometric pressure or heavy precipitation events
Janice Wiederhoeft	Concerns about destruction of quiet neighborhood and loss of property value; concern about biomass wood supply and potential use of garbage or tires; concern about increased truck traffic; concern about air pollution and health for elderly and asthmatic
Travis Wieland	Support project; concern that it is being held up

RECOMMENDATION:

_X__ Environmental review complete. Preparation of an environmental impact statement is not necessary.

_____ Prepare an environmental impact statement.

Submitted by: Kenneth C. Rineer
Environmental Analysis and Review Specialist

Date: October 21, 2010

This environmental assessment complies with Wis. Stat. § 1.11. and Wis. Admin. Code § PSC 4.20.

By: Kathleen J. Zuelsdorff
WEPA Coordinator

Date: October 22, 2010

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Attachments